

DISCIPLINE & ASSOCIATES

## **ALL IN ONE PAST QUESTIONS**

### **FIRST SEMESTER LEVEL 300**

ACCT 301, FINC 301, UGBS 301, UGBS 303, OHRM 303 & MKTG 303

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ALL THE BEST IN YOUR REVISION



~DISCIPLINE (CEO@D&A)

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**UNIVERSITY OF GHANA**  
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**DEPARTMENT OF FINANCE**

**B.SC ADMINISTRATION, FIRST SEMESTER EXAMINATIONS**  
**2018/2019**

**FINC 301: INTRODUCTION TO BUSINESS FINANCE II (3 credits)**  
**TIME ALLOWED: 3 HOURS**

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**INSTRUCTIONS**

1. This is a closed book exam
2. You are to provide proof of all answers in the answer booklet provided where calculations are needed.
3. For the multiple-choice section, circle the letter that corresponds to your answer directly on the question paper
4. You are permitted to use calculators
5. You are to attempt all questions

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1. Net profit ratio signifies
  - a. dividends for shareholders
  - b. operational profitability
  - c. liquidity position
  - d. profit for lenders
2. Which of the following can be inferred from rising costs of goods (COGS) as a percentage of sales?
  - i. Sales revenue is increasing
  - ii. Contribution margin per unit is declining
  - iii. The firm's supply source is becoming a competitive disadvantage
  - a. i only
  - b. ii only
  - c. i and iii
  - d. ii and iii
3. When we consider the time value of money, a cedi received in the future
  - a. Is worth less than a cedi received today
  - b. Is worth more than a cedi received today
  - c. Is the same as a cedi received today
  - d. Depends on the compounding used to determine the relationship to a cedi received today
4. With respect to the time value of money, the future value relationship to the rate of the interest is best described as:
  - a. No relationship
  - b. Logarithmic
  - c. A positive relationship
  - d. A negative relationship
5. Gross Profit Ratio for a firm remains same but the Net Profit Ratio is decreasing. The reason for such behavior could be:
  - a. Increase in Costs of Goods Sold,
  - b. Increase in Expense,
  - c. Increase in Dividend,
  - d. Decrease in Sales.
6. During year 1, the sales and Cost of goods sold were Ghs. 1,200,000 and Ghs. 860,000 respectively. Next year, the sales are expected to increase by 10%. The Cost of goods sold for next year would be:
  - a. Ghs 860,000,
  - b. Ghs. 980,000,

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- c. Ghs. 946,000,  
d. Ghs.880,000.
- 7. The order of priority for claims if a firm must be liquidated is
  - a. Preferred stock, senior debt, subordinated debt, common stock
  - b. Preferred stock, common stock , senior debt, subordinated debt
  - c. senior debt, subordinated debt, preferred stock, common stock
  - d. senior debt, preferred stock, subordinated debt, common stock
- 8. Determine a firm's total asset turnover (TAT) if its net profit margin (NPM) is 5 percent, total assets are \$8 million, and ROI is 8 percent
  - a. 1.60
  - b. 2.05
  - c. 2.50
  - d. 4.00
- 9. When a company borrows to finance its projects, all else equal
  - a. Its profitability increases
  - b. It improves its solvency position
  - c. Its liquidity position improves
  - d. Its financial risk increases
- 10. One of the primary benefits of sole proprietorship of business is
  - a. Unlimited liability
  - b. Unlimited life
  - c. Capital raising capacity
  - d. None of the above
- 11. Which of the following is a valid criticism concerning the goal of firms to maximize profits?
  - a. profit maximization ignores expenses
  - b. profit maximization is completely unrelated to shareholder wealth
  - c. profit maximization may ignore the timing of those profits
  - d. there are no valid criticisms of profit maximizing firms
- 12. Which of the following parties have the proper incentives to make risky, value increasing investments for the firm?
  - a. Suppliers
  - b. Creditors
  - c. Shareholders
  - d. managers who are only compensated with a salary

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13. An agent of a firm could be any of the following:

- a. 100% owner of the firm
- b. the IRS agent in charge of auditing the firm's tax return
- c. an employee who does not own any proportion of the firm
- d. a supplier of the firm

14. What of the following is FALSE regarding debt capital?

- a. Debt holders are required to receive interest payments at fixed intervals.
- b. Debt holders receive the amount of their loan (called principal) at the debt's maturity date.
- c. Debt holders can force the firm into bankruptcy if interest payments are not made.
- d. Debt holders have voting rights for the firm's board of directors.

15. Which of the following is FALSE regarding equity capital?

- a. Common stock holders bear most of the firm's business and financial risk.
- b. Preferred stock holders receive a fixed annual payment on their invested capital.
- c. Common stock holders have ownership in the firm by voting for the firm's management.
- d. Preferred stockholders can force the firm into bankruptcy if dividend payments are not paid.

16. Which one of the following credit terms is most apt to produce the shortest accounts receivable period?

- a) Net 10
- b) 2/10, net 30
- c) 2/20, net 45
- d) 3/5, net 10

17. What does the following trade credit jargon refer to? "5/7 net 30".

- a) A discount of 5% will be given full payment within 7 days. Failing that, the account must be settled in 30 days.
- b) A discount of 7% will be given for full payment within 5 days. Failing that, the account must be settled in 30 days.
- c) A discount of 30% will be given for full payment within 7 days. Failing that, the account must be settled in 30 days.
- d) A discount of 5% will be given for full payment within 30 days. Failing that, the account must be settled in 7 days.

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18. Which of the following best describes the economic order quantity (EOQ) model?
- a) The EOQ model is based on the trade-off between average order cost which increase with order quantity and average storage cost which declines with order quantity.
  - b) The EOQ model is based on the trade-off between average order cost which increases with order quantity and average storage cost which increases with order quantity.
  - c) The EOQ model is based on the trade-off between average order cost which declines with order quantity and average storage cost which increase with order quantity.
  - d) The EOQ model is based on the trade-off between average order cost which declines with order quantity and average storage cost which declines with order quantity.
19. Which of the following is an internal source of investment funding?
- a) Issuing bonds
  - b) Sale of stocks
  - c) Undistributed profits
  - d) All of the above are internal sources
20. If  $EOQ = 360$  units, order costs are Ghc5 per order, and carrying costs are Ghc.20 per unit, what is the usage in units?
- a) 129,600 unit
  - b) 2,592 units
  - c) 25,920 units
  - d) 18,720 units
21. The credit policy of Spurling Products is "1.5/10, net 35". At present 30% of the customers take the discount, 62% pay within the net period, and the rest pay within 45 days of invoice. What would receivables be if all customers took the cash discount?
- a) Lower than the present level
  - b) No change from the present level
  - c) Higher than the present level
  - d) Unable to determine without more information
22. The Winters Co. has annual sales of Ghc 918,700. Cost of goods sold is equal to 55 percent of sales. The firm has an average accounts payable balance of Ghc 72,400. How many days on average does it take the Winters Co. to pay its suppliers?

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- a) 38 days
- b) 46 days
- c) 52 days
- d) 34 days

23. Marketable securities are:

- a. fixed assets
- b. intangible assets
- c. highly liquid short-term investments
- d. current liabilities

24. The cash flows resulting from sale or purchase of marketable securities is classified as:

- a. operating cash flow
- b. investing cash flow
- c. financing cash flow
- d. none of the above

25. Which of the following was not suggested by John Maynard Keynes as a reason for holding cash?

- a. Speculative motive.
- b. Investment motive.
- c. Precautionary motive.
- d. Transactions motive.

26. What is the cost of discount forgone if your firm is not able to take advantage of the terms of sale 3/15 net 45?

27. Which of the following is a best offer for a 10-year consulting contract you have just signed on?

- a. \$10,000 today, \$5000 at the end of year 5 and \$8,000 at the end of year 10
- b. \$5,000 today, \$15000 at the end of year 5 and \$3,000 at the end of year 10
- c. \$10,000 today, \$8000 at the end of year 5 and \$5,000 at the end of year 10
- d. \$10,000 today, \$10000 at the end of year 5 and \$3,000 at the end of year 10

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28. Determine the present value for an account that has withdrawals of \$180,532.00 today and is expected have deposits of \$25,000 per year for the first five years, \$33,000 per year for the next five years, and \$46,000 per year for the following five years. Discount rate is 12.36%.
- a. \$191,045.2109
  - b. \$206,404.16
  - c. \$25,872.1556
  - d. \$28,572.1565
29. If your dream car will cost \$200,000 10-years from today, how much must you save on monthly basis, in arrears, for you to realise your dream if interest rate on investments is expected to stay at 15%?
- a. 3262.9691
  - b. 3226.6991
  - c. 3320.8677
  - d. 3230.7786
30. How long will it take to make five times the value of your current investment if the interest rate is 12.5%? (approximate to the nearest whole)
- a. 12
  - b. 14
  - c. 13
  - d. 15
31. What is the most likely to be true when a firm experiences a reduction in its debtors turnover ratio?
- a. It will experience reduction in the average collection period
  - b. It will experience a reduction in average receivables
  - c. It will experience an increase in its average collection period.
  - d. Insufficient information to tell the outcome
32. Which of the following statements is true?
- b. Cash is decreased when new debt is issued to purchase holiday merchandise.
  - a. Accepting the credit offered by a supplier is a source of cash.
  - c. Increasing the use of trade credit offered by a supplier is a use of cash.
  - d. Collecting an accounts receivable is a use of cash.

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33. Which one of the following will increase the operating cycle?
- e. increasing the inventory period
  - c. decreasing the cash cycle
  - b. decreasing the accounts payable period
  - a. increasing the accounts payable period
  - d. increasing the accounts receivable turnover rate
34. Which one of the following actions should a manager take if he or she wants to decrease the operating cycle?
- d. decrease the period of time for which credit is granted to customers
  - c. decrease the rate at which the average inventory is sold
  - a. delay payments to suppliers to decrease the cash cycle
  - b. increase the inventory level while maintaining constant sales
  - e. purchase all inventory with cash
35. All else equal, which one of the following will decrease the cash cycle?
- c. increasing the operating cycle
  - e. decreasing the accounts receivable turnover rate
  - d. decreasing the accounts payable period
  - b. increasing the inventory turnover rate
  - a. increasing the credit period granted to a customer
36. In a firm, the forecast of wages for month of December, January, February and March are Gh 4,800, Gh 6,000, Gh 6,400 and Gh 6,800. The time-lag in payment of wages is 1/8 month. Determine the amount of wages payable in each month January to March.
- a. Gh 6,750, Gh 6,350 and Gh 5,850
  - b. Gh 5,850, Gh 6,350 and Gh 6,750
  - c. Gh 5,850, Gh 6,750 and Gh 6,350
  - d. None of the above
37. Given estimated sales in February, March, April, May and June are Gh 90,000, Gh 96,000, Gh 54,000, Gh 87,000 and Gh 63,000. In case 50% of sales are realized in the next month and balance in the next of next month, determine cash collection from sales in April and May.
- a. Gh 93,000 and Gh 75,000
  - b. Gh 93,000 and Gh 70,500
  - c. Gh 75,000 and Gh 70,500
  - d. None of the above

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38.In a month, payment for salary was Gh. 5,750 when the lag in payment of salary is 1/8 month. If total salaries of current month are Gh 6,000, Determine the salaries of previous month.

- a. Gh 4,800
- b. Gh 4,250
- c. Gh 4,000
- d. Gh 4,750

39. Mark sells goods at a gross profit margin of 30%. Which of the following statements is true?

- a. Goods sold for Gh 800 will have cost Mark Gh 240.
- b. Goods sold for Gh 800 will have cost Mark Gh 560.
- c. Goods sold for Gh 800 will have cost Mark Gh 320.
- d. Goods sold for Gh 800 will have cost Mark Gh 392

40. Using equation method, Break-even point is calculated as

- a) Sales = Variable expenses + Fixed expenses + Profit
- b) Sales = Variable expenses + Fixed expenses - Profit
- c) Sales = Variable expenses - Fixed expenses + Profit
- d) None of the above

41. Given selling price is Gh 10 per unit, variable cost is Gh 6 per unit and fixed cost is Gh 5,000. What is break-even point?

- a) 500 units
- b) 1,000 units
- c) 1,250 units
- d) None of the above

42. Given selling price is Gh 20 per unit, variable cost is Gh 16 per unit contribution is

- a) Gh 1.25 per unit
- b) Gh 4 per unit

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- c) Gh 0.8 per unit
- d) None of the above

43. A product has a selling price of Gh10 and a marginal cost of Gh5.

Sales for March are Gh100,000 and fixed costs for March are Gh20,000. What is the profit for March?

- a. Gh40,000
- b. Gh30,000
- c. Gh20,000
- d. Gh50,000

44. A company's sales for September are Gh500,000 and its variable cost of sales is Gh200,000. If its break-even sales are Gh300,000 what is the profit for September?

- a. Gh180,000
- b. Gh120,000
- c. Gh200,000
- d. Gh300,000

45. Shareholder wealth" in a firm is represented by:

- a. the number of people employed in the firm.
- b. the book value of the firm's assets less the book value of its liabilities.
- c. the amount of salary paid to its employees.
- d. the market price per share of the firm's common stock.

## **SECTION B**

### **QUESTION ONE (15 Marks)**

As the financial consultant to a small budding firm, you came across the following financial details during the annual health diagnostics you usually conduct. Net income for the year just ended stands at \$24,500. Sales for the year in question was \$300,000. Current assets, which includes an inventory value of \$26,000 also stood at \$80,000. Equity, long-term debt and total current liabilities are \$200,000; \$150,000 and \$120,000 respectively.

**Required:** Using the appropriate ratios, comment and advise the firm on its liquidity and profitability situation.

### **QUESTION TWO (15 Marks)**

In 1790, your great-great grand parents left \$4,600 each for the first two children born to a particular bloodline within the chain. They stipulated that the money be invested and that the principal not be touched for 100 years.

- a. If the money had been invested at 4%, compounded yearly, how much would each child have had in 1890?
- b. How much if it had been invested at 5%, compounded yearly?
- c. What interest rate would allow the investment to be multiplied 75 times in the 100 years?
- d. A friend of your needs advise on which bank loan to go for. Bank A is offering 20% compounded monthly and Bank B is offering 22% compounded quarterly. Advise your friend accordingly

### **QUESTION THREE (25 Marks)**

**A1.** Anuonyam is considering paying GH¢ 150 into a fund on a monthly basis for four years starting in one year's time. The interest earned will be 1% per month. Once all these payments have been made, the investment will be transferred immediately to an account that will earn interest at 12% per annum until maturity. The fund matures in five years' time after the last payment is made into it. Calculate the terminal value of the fund in 7 years' time.

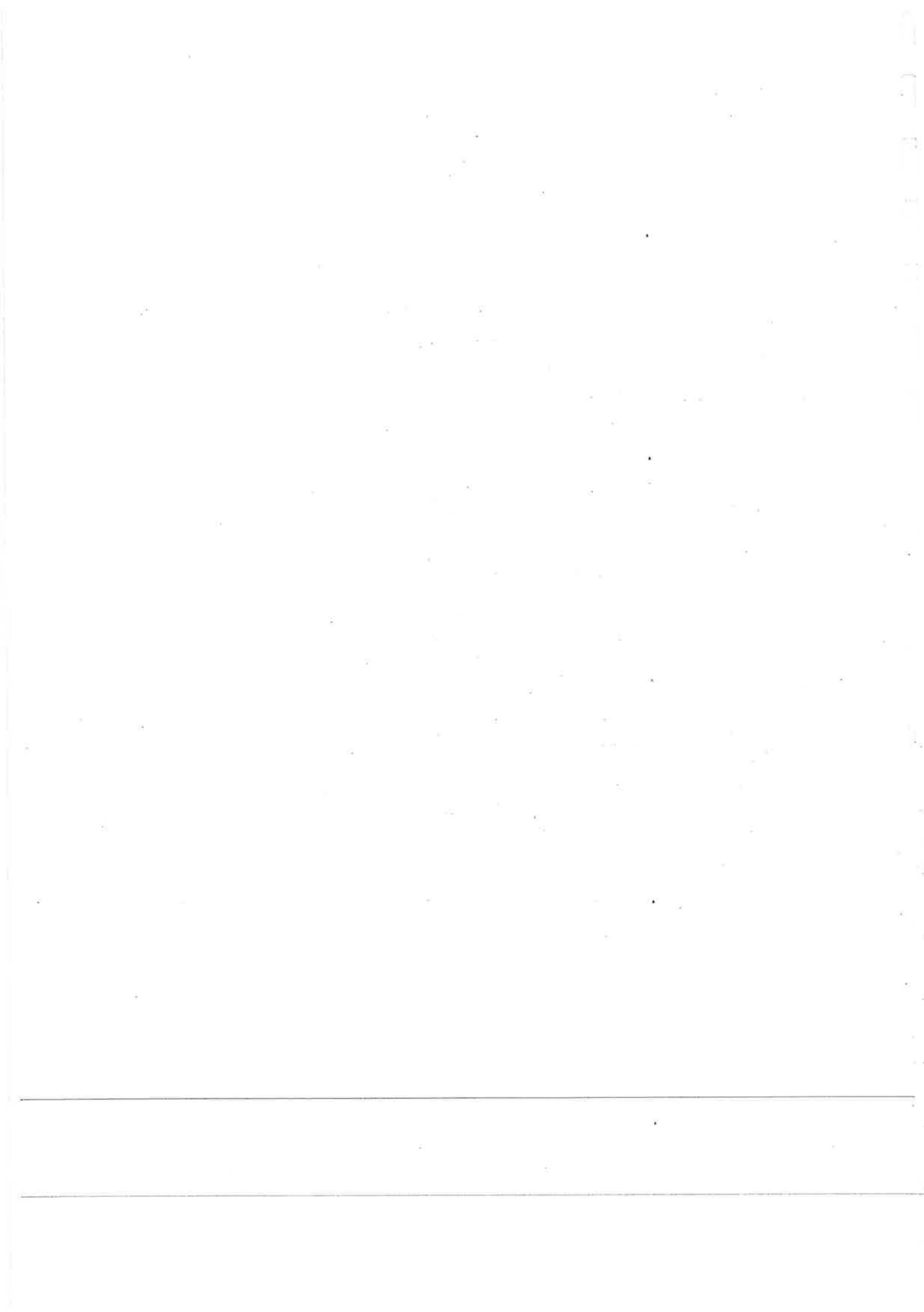
**(10 MARKS)**

**A2.** Mr. Smart heard about the Ghana Government's 'Smart Borrowing' concept and borrowed GH¢ 25,000 to have a successful graduation party and he wants to pay off the loan in 12 monthly instalments otherwise the bank will come for his certificate awarded to him since it was pledged as a collateral for the loan.

A. What should the monthly repayments be if the annual interest rate is 18%?

(5 marks)

B. Construct an amortisation schedule for the first five months (10 marks)



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B.SC ADMINISTRATION, FIRST SEMESTER EXAMINATIONS:  
2017/2018

FINC 301: INTRODUCTION TO BUSINESS FINANCE (3 Credits)

INSTRUCTIONS

1. This is a closed book exam
2. You are permitted to use calculators
3. Show all relevant calculations where needed
4. You are to return the question papers
5. Start each Section on a new page

Two and half ( $2 \frac{1}{2}$ ) HOURS

EXAMINATION

**SECTION A (35 Marks) (Attempt All in this Section)**

**QUESTION A**

Sea Blue Ventures, a fishing company, has just approached you to help in determining their financial capacity to pursue the growth agenda they have for the incoming fiscal year of 2018. The CEO, Kofi Bentum, is of the view that that they can grow their 2017 revenue of ₦250,000 by a good 22% for the year 2018. Because they have not been very successful in raising external capital since they started business 5 years ago, Kofi does not want to risk getting stuck in the middle; he wants to be sure that they can pull this growth agenda off smoothly. Your work is cut out for you: to advise Sea Blue Ventures on the feasibility or otherwise of their growth objective. Additional enquiries reveal that Sea Blue normally has net profit margin of 28%, out of which they usually retain 50% for future growth. In relation to this assignment, Sea Blue would also like you to recommend changes, if any, that must be made to their standard dividend policy. In other words, can and should they pay dividends in 2018 and if so how much?

Using Table 1 and the information provided in the write-up above, fill in the questions that are topmost on the mind of Kofi Bentum, the CEO.

Table 1

| Balance sheet as at 31-Dec-17                       |                |
|---|----------------|
| Assets  | ₵              |
| Cash & Marketable Securities                        | 22,200         |
| Accounts Receivable                                 | 34,100         |
| Inventories   | 82,000         |
| <b>Total Current Assets</b>                         | <b>138,300</b> |
| Fixed Assets  | 270,000        |
| <b>Total Assets</b>                                 | <b>408,300</b> |
| Liabilities and Stockholders' Equity                | ₵              |
| Account Payable                                     | 62,000         |
| Notes Payable                                       | 13,000         |
| <b>Total Current Liabilities</b>                    | <b>75,000</b>  |
| Long-term Debt                                      | 150,000        |
| Common Stock  | 110,200        |
| Retained Earnings                                   | 73,100         |
| <b>Total Liabilities &amp; Stockholders' Equity</b> | <b>408,300</b> |

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Fill Bentum in on the 2018 values for the following:

- a. Cash and Marketable securities.....
- b. Accounts Receivable.....
- c. Inventories.....
- d. Fixed assets.....
- e. Accounts payable.....
- f. Notes Payable.....
- g. Retained Earnings (assuming no dividends).....
- h. Retained Earnings (assume dividend payment).....
- i. Net Profit.....
- j. Additional (Excess) Financing Need (assume no dividend payment).....
- k. Additional (Excess) financing need (assume dividend payment).....
- l. Dividends payable in view of the growth agenda (GH₵).....

## QUESTION B

2. Your Uncle is in the process of setting up a University. Having heard of your business administration training, he approaches you, his pro-bono consultant, for some pointers on how to ensure profitability of his project. You help him with cost capturing and arrive at a total fixed cost of 1,708,000 cedis, being cost of building, fixtures, etc. Variable cost is captured in such a way as to provide contribution margin of 30%. Having accomplished that, you conduct a brief

market survey and conclude that the average annual tuition per university student is 5,000 cedis per annum.

Based on the information, your Uncle wants you to help him answer the following questions: (round up your answers to the nearest whole)

- a. Given his costs, what is the minimum student number that must enrol at the university for him to breakeven?.....
- b. If he wants to make an estimated annual profit of 280,000 cedis, how many students must he target and get the marketing team to bring in?  
.....
- c. Upon second thoughts, your Uncle thinks you can tinker with the fixed cost so he breaks even at a student population that is 20% below the breakeven quantity for (a). What is the maximum fixed cost, all other values staying same will bring this about?.....
- d. If fixed cost go up by 20%, instead of coming down, what is the maximum tuition fee that can be charged if student enrolment cannot be increased beyond the breakeven value in (a)? .....

### **SECTION B (ANSWER ALL QUESTIONS IN THIS SECTION)**

1. The time from the receipt of raw materials to the collection of the cash of the sale of the finished good is called a firm's.
  - a) Operating cycle
  - b) Cash conversion cycle
  - c) Inventory period
  - d) Accounts receivables period
2. What can a company do to shorten its cash conversion cycles?
  - a) Turn over inventory as quickly as possible
  - b) Collect accounts receivable as quickly as possible
  - c) Pay accounts as slowly as possible
  - d) All the above

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3. The inventory control system technique that segregates inventory into three groups is called.
  - a) Economic order quantity model
  - b) ABC system
  - c) Material requirements planning systems
  - d) First-in-time system
4. The credit policy of Spurling Products is "1.5/10, net 35". At present 30% of the customers take the discount, 62% pay within the net period, and the rest pay within 45 days of invoice. What would receivables be if all customers took the cash discount?
  - a) Lower than the present level
  - b) No change from the present level
  - c) Higher than the present level
  - d) Unable to determine without more information
5. Which of the following best represents the total inventory costs, T, which S is total usage of the inventory item for the period, Q is the quantity, O is cost per order, and C is carrying costs per unit for the period?
  - a)  $T = C(Q/2) + O(S/Q)$
  - b)  $T = C(S/Q) + O(Q/2)$
  - c)  $T = \text{SQRT } [2(O)(S)/C]$
  - d)  $T = \text{SQRT } [2(C)(S)/O]$
6. The goal of credit policy is to
  - a) Extend credit to the point where marginal profit equal marginal costs
  - b) Minimize bad debts losses
  - c) Minimize collection expenses
  - d) Maximize sales

7. Suppose you open an account for your children with GH¢10,000. The account is to earn 5% interest initially for 4 years and 10% thereafter. You are to find the total amount that will be in her account at the end of 7 years.
- a) 11,576
  - b) 16,178
  - c) 14,071
  - d) 12,762
8. How many years will it take for an investment of GH¢7,500 to grow to GH¢23,000 if it is invested at 8% annually.
- a) 15.46
  - b) 16.54
  - c) 14.56
  - d) 3.52 years
9. Calculate the EAR for a loan that has a 5.45% quoted annual interest rate compounded monthly.
- a) 6.59%
  - b) 4.89%
  - c) 5.45%
  - d) 5.59%
10. Congratulations! You have just won a small lottery. It will pay you either 5 annual payments of GH¢15,000 each (with the first payment to be received two years from today), or a single lump sum to be received today. If you can invest at a 6% annual rate of interest, what is the least you should accept as the lump sum payment amount?
- a) GH¢75,000
  - b) GH¢66,976.58
  - c) GH¢63,185.46

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- d) GH¢59,608.92  
e) GH¢89,629.78
11. Which of the following accounts would pay you the highest effective annual rate?
- Stated annual rate of 6.05%, compounded annually
  - Stated annual rate of 6.01%, compounded semi-annually
  - Stated annual rate of 5.95%, compounded quarterly
  - Stated annual rate of 5.90%, compounded monthly
  - Stated annual rate of 5.85%, compounded daily (assuming 365 days a year)
12. You have financed the purchase of a used Mercedes with a GH¢31,500 loan with a 5-year term, monthly payments, and an 8% stated annual rate. What is the amount of your monthly loan payment?
- GH¢657.45
  - GH¢583.33
  - GH¢477.92
  - GH¢638.71
  - GH¢350.00
13. You have just invested GH¢3,000 into an account that will earn a 9% annual interest rate. You want to have exactly GH¢8,000 in the account at the end of 5 years. The account allows you to make one deposit at the end of the 3<sup>rd</sup> year. In order to have exactly GH¢8,000 at the end of year 5, how much must your deposit at the end of the 3<sup>rd</sup> year?
- GH¢2,848.35
  - 2,613.17
  - 2,397.40
  - 3,384.13
  - None of the above answers is within GH¢50 of the correct amount.

14. Which of the follow is least likely to be considered a short-term marketable security?
- An original issue 30-year corporate bond with one-year remaining until final maturity.
  - An original issue 30-year government bond with one-year remaining until final maturity.
  - A 90-year Treasury bill
  - Short-term corporate debt instruments with a 9-month original maturity.
15. The optimal balance of marketable securities held to take care of probable deficiencies in the firm's cash account is referred to as the \_\_\_\_\_ segment in the firm's portfolio of short-term marketable securities.
- Ready cash
  - Controllable cash
  - Free cash
  - Cash and cash equivalent
16. Which would be an inappropriate investment for temporarily idle corporate cash that will be used to pay quarterly dividends three months from now?
- An originally issued 30-year Treasury bond with a current annual yield of 9.4 percent that matures in 88 days.
  - An originally issued 30-year Treasury bond with a current annual yield of 9.7 percent that matures in 2 years.
  - 90-day commercial paper with a current annual yield of 9.6 percent
  - A 3-month certificate of deposit with a current annual yield of 9.5 percent
17. Which of the following marketable securities is issued by the Ghana Government?

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- a) Commercial paper
- b) Negotiable certificates of deposit
- c) Repurchase agreement
- d) T-bills

18. Which of the following statements most accurately describes the modern approach to cash management?

- a) Cash management involves the efficient disbursement of cash.
- b) Cash management involves the efficient collection and disbursement of cash
- c) Cash management involves the efficient processing, collection and depositing of cash
- d) Cash management involves the efficient processing, collection and depositing of cash

19. Which of the following is not a technique to speed up collections?

- a) Expedite the preparing and mailing of the invoice to customers
- b) Replace a lockbox system with the direct mailing of payments to the firm.
- c) Reduce the time it takes payments received from customers to be available as usable funds to the firm
- d) Accelerate how quickly customers mail payments to the firm.

20. Concentration banking occurs when the firm.....

- a) Moves cash from regional lockboxes to a centralized cash pool at a single institution
- b) Replaces their lockbox system with a system that involves the direct payment to the firm
- c) Reduces the control over the inflow and outflow of corporate cash
- d) Increases the quantity of cash balances that are "idle" (not earning a return)

21. The marketable securities held for meeting controllable outflows such as taxes or dividends is referred to as the ..... Segment in the firm's portfolio of short-term marketable securities.
- a) Ready cash
  - b) Controllable
  - c) Free cash
  - d) Cash and cash equivalents
22. A collection service provided by the firm's financial institution that receives electronic payments and accompanying remittance data and communicates this to the company in a specific format is referred to as what?
- a) Electronic lockbox
  - b) Email
  - c) Electronic mail
  - d) Euro Electronic mail.

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**SECTION C (30 Marks) (ATTEMPT ALL MCQs AND ONE QUESTION ONLY FROM THE SUB-SECTION)**

1. The length of time between the purchase of inventory and the receipt of cash from the sale of that inventory is called the:
  - A. operating cycle.
  - B. inventory period.
  - C. accounts receivable period.
  - D. accounts payable period.
  - E. cash cycle.
2. The length of time that elapses between the day a firm purchases an inventory item and the day that item sells is called the:
  - A. operating cycle.
  - B. inventory period.
  - C. accounts receivable period.
  - D. accounts payable period.
  - E. cash cycle.
3. The length of time between the sale of inventory and the collection of the payment for that sale is called the:
  - A. operating cycle.
  - B. inventory period.
  - C. accounts receivable period.
  - D. accounts payable period.
  - E. cash cycle
4. The length of time between the day a firm purchases an item from its supplier until the day that supplier is paid for that purchase is called the:
  - A. operating cycle.
  - B. inventory period.
  - C. accounts receivable period.
  - D. accounts payable period.
  - E. cash cycle.

5. Central Supply purchased a toboggan for inventory this morning and paid cash for it. The time period between today and the day Central Supply will receive cash from the sale of this toboggan is called the:
  - A. operating cycle.
  - B. inventory period.
  - C. accounts receivable period.
  - D. accounts payable period.
  - E. cash cycle.
6. Steve has estimated the cash inflows and outflows for his hardware store for next year. The report that he has prepared recapping these cash flows is called a:
  - A. pro forma income statement.
  - B. sales projection.
  - C. cash budget.
  - D. receivables analysis.
  - E. credit analysis.
7. Cash management primarily involves:
  - A. optimizing a firm's collections and disbursements of cash.
  - B. maximizing the income a firm earns on its cash reserves.
  - C. reconciling a firm's book balance with its bank balance.
  - D. determining the optimal level of liquidity a firm should maintain.
  - E. determining the best method of raising capital.
8. Which one of the five Cs of credit refers to a firm's financial reserves?
  - A. character
  - B. capacity
  - C. collateral
  - D. conditions
  - E. capital
9. Which one of the five Cs of credit refers to the general economic situation in the customer's line of business?
  - A. capacity
  - B. character
  - C. conditions
  - D. capital
  - E. collateral

INDEX NUMBER.....

10. Which one of the following statements is correct?
- A. An aging schedule helps identify those customers who are the most delinquent.
  - B. The percentage of total receivables that falls within a certain time period on an aging schedule will remain constant over time even if the firm has seasonal sales.
  - C. Normally firms call their delinquent customers prior to sending them a past due letter.
  - D. A constant average collection period over a period of time is cause for concern.
  - E. It is common practice when a customer files for bankruptcy to sell that customer's receivable at face value.
11. The EOQ model is designed to determine how much:
- A. total inventory a firm needs in any one year.
  - B. total inventory costs will be for any one given year.
  - C. inventory should be purchased at a time.
  - D. inventory will be sold per day.
  - E. a firm loses in sales per day when an inventory item is depleted.
12. The EOQ model is designed to minimize:
- A. production costs.
  - B. inventory obsolescence.
  - C. the carrying costs of inventory.
  - D. the costs of replenishing inventory.
  - E. the total costs of holding inventory.
13. What is a seasoned equity offering?
- A. an offering of shares by shareholders for repurchase by the issuer
  - B. shares of stock that have been recommended for purchase by the SEC
  - C. equity securities held by a firm's founder that are being offered for sale to the general public
  - D. sale of newly issued equity shares by a firm that is currently publicly owned
  - E. a set number of equity shares that are issued and offered to the public annually

14. Soup Galore is a partnership that was formed three years ago for the purpose of creating, producing, and distributing healthy soups in a dried form. The firm has been extremely successful thus far and has decided to incorporate and offer shares of stock to the general public. What is this type of an equity offering called?

- A. venture capital offering
- B. shelf offering
- C. private placement
- D. seasoned equity offering
- E. initial public offering

15. Roy owns 200 shares of R.T.F., Inc. He has opted not to participate in the current rights offering by this firm. As a result, Roy will most likely be subject to:

- A. an oversubscription cost.
- B. underpricing.
- C. dilution.
- D. the Green Shoe provision.
- E. a locked in period.

Answer One Question from this sub-section

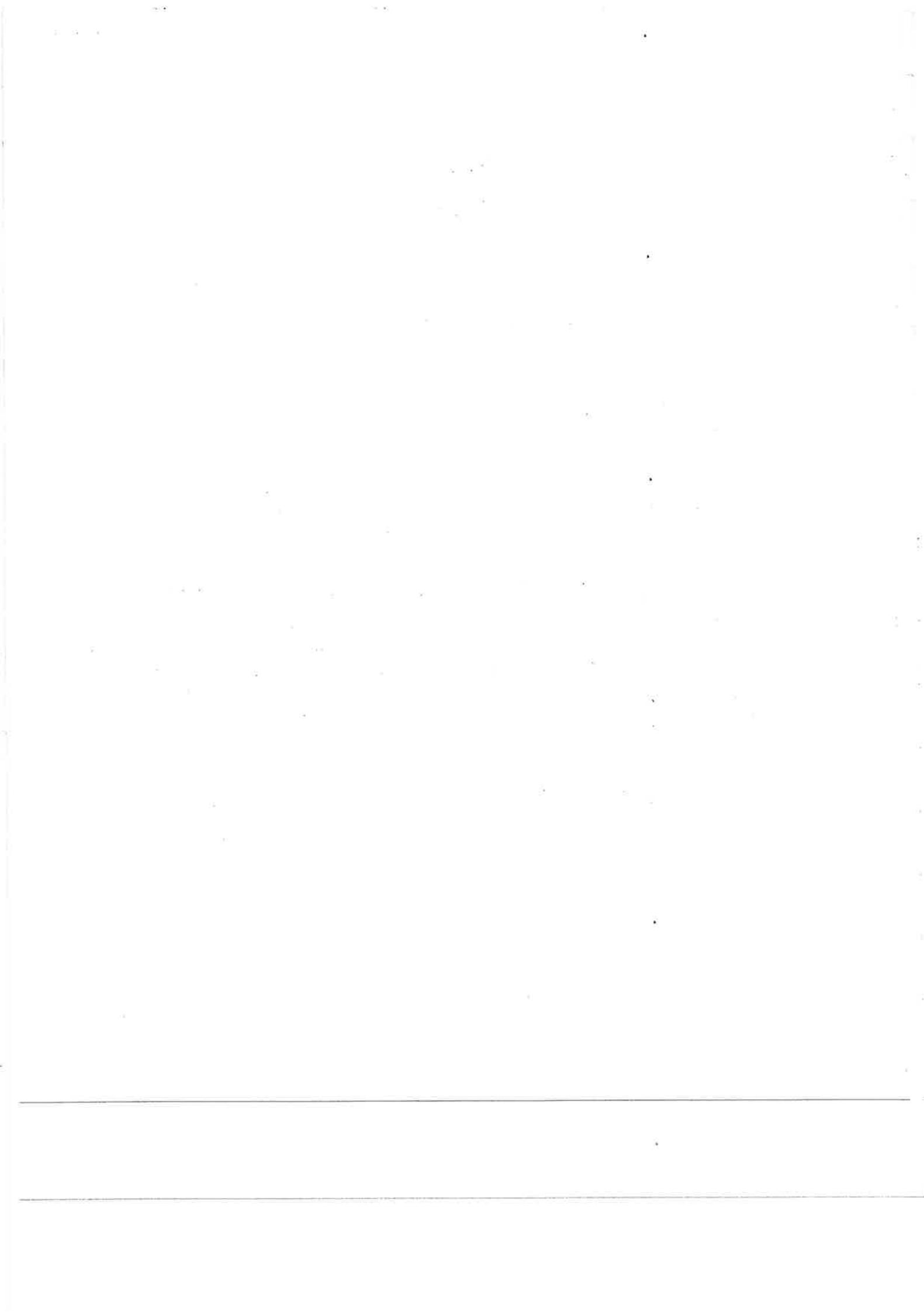
#### Question A

- a) Home Roasted Turkeys disburses checks every 4 weeks that average GHS 70,000 and take 5 days to clear. How much interest can the company earn if it delays transfer of funds from an interest-bearing account that pays 0.02 percent per day for these 5 days? Ignore the effects of compound interest. Assume 52 weeks in a year.
- b) Assume all suppliers to a large retail chain offer credit terms of 2/10, net 30. The retail chain consistently takes the 2 percent discount and pays in 60 days. When pressed on the issue, the retail chain tells the suppliers they can either accept the payments as they currently are or lose the business. Is this ethical? How might this impact a small supplier versus a large supplier? Explain.

**Question B**

- a) A firm sells 4,500 units of an item each year. The carrying cost per unit is GHS 2.15 and the fixed costs per order are GHS .67. What is the economic order quantity?
- b) It can be argued that the decision to accept venture capital is one of the most critical decisions an entrepreneur must make. Explain why.
- c) You are doing some comparison shopping. Five stores offer the product you want at basically the same price. Which one of the following stores offers the best credit terms if you plan on taking the discount?

| <u>Store</u> | <u>Credit terms</u> |
|--------------|---------------------|
| A            | 1/10, net 20        |
| B            | 2/10, net 10        |
| C            | 2/5, net 30         |
| D            | 1/15, net 45        |
| E            | 2/15, net 30        |





UNIVERSITY OF GHANA

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DEPARTMENT OF FINANCE

B.SC ADMINISTRATION, FIRST SEMESTER EXAMINATIONS:  
2016/2017

**FINC 301: INTRODUCTION TO BUSINESS FINANCE (3 Credits)**

**INSTRUCTIONS: ANSWER ALL QUESTIONS  
USE THE ANSWER BOOKLET PROVIDED**

**TIME ALLOWED: THREE (3) HOURS**

## SECTION A:

Indicate whether the following statements are True/False

1. If a bank compounds savings accounts quarterly, the nominal rate will exceed the effective annual rate.....
2. The truly wonderful thing about diversification is that 100% of risk can be diversified away, given a large enough portfolio.....
3. Disregarding risk, if money has time value, it is impossible for the present value of a given sum to exceed its future value.....
4. The statement that 'resources are scarce' meaning limited in supply implies no country or individual can achieve her/his goals and therefore goal setting is irrelevant in contemporary times.....
5. Time lines cannot be constructed for annuities unless all the payments occur at the end of the periods.....

### Multiple Choice Questions

6. Which of the following is not a source of funds?
  - a) Decrease in inventory levels
  - b) Decrease in accounts payable
  - c) Decrease in accounts receivable
  - d) Decrease in fixed assets
7. Which of the following actions should a Manager take if he or she wants to decrease the operating cycle?
  - a) Decrease the period of time for which credit is granted to customers
  - b) Decrease the rate at which the average inventory is sold
  - c) Delay payments to suppliers to decrease the cash cycle
  - d) Increase the inventory level while maintaining constant sales
8. Which one of the following will decrease the cash cycle?
  - a) Increasing the operating cycle
  - b) Decreasing the accounts receivable turnover rate
  - c) Decreasing the accounts payable period

- d) Increasing the inventory turnover rate
9. Which of the following would be included in a cash budget?
- Depreciation charges
  - Dividends
  - Goodwill
  - Patent amortization
10. Which of the following is not a metric to use for measuring the length of the cash cycle?
- Acid tests days
  - Accounts receivable days
  - Accounts payable days
  - Inventory days
11. Which of the following is an internal source of investment funding?
- Issuing bonds
  - Sale of stocks
  - Undistributed profits
  - All of the above are internal sources
12. The method of raising funds for capital investment that involves the greatest risk to the firm is :
- Borrowing by selling bonds
  - Relying on retained profits
  - Issuing common stock
  - Raising the dividend rate
- 
13. A negative net cash inflow on a cash budget indicates that a firm:
- Has cash outflows other than those related to accounts payable
  - Is facing bankruptcy
  - Has projected cash disbursements that exceed the projected cash collections
  - Has funds available for short-term investing
14. The conditions under which a firm sells its goods and services for cash or credit are called the:

- a. Terms of sale
  - b. Credit analysis
  - c. Collection policy
  - d. Payables policy
15. The process of determining the likelihood that customers will not pay is called:
- a) The terms of sale
  - b) Credit analysis
  - c) The collection policy
  - d) The payables policy
16. The procedures a firm follows in the pursuit of customer payments are referred to as the firm's \_\_\_\_\_ policy
- a) Sales
  - b) Credit
  - c) Collection
  - d) Payables
17. Forecasting is a better and more efficient way of assessing the credit risk than using financial ratios:
- a) Correct
  - b) False
  - c) It depends – if resources are scarce a credit rating based on financial ratios may prove more cost-efficient
  - d) None of the above
18. Your company purchased ₦10,000 worth of inventory on January 2<sup>nd</sup> on credit. The terms of the sale were 3/15, net 45. What is the effective annual interest rate if you pay the full amount in 45 days?
- a) 3.1 percent
  - b) 28.0 percent
  - c) 37.6 percent
  - d) 44.9 percent
  - e) 74.3 percent
19. Karloff's Medical Supply maintains an average inventory of 2,000 imitation human hands for sale to medical schools. The carrying cost per hand per year is estimated to be ₦1.25. Karloff places an order for 4,000 hands on the first of each quarter and the order cost is ₦80. What will Karloff's total carrying costs be if the firm switches to the EOQ method of inventory?

- a) £894
- b) £1,215
- c) £2,500
- d) £160,000
- e) £320,000

20. If EOQ = 40 units, order cost are £2 per order, and carrying cost are £.20 per unit, what is the usage in units?

- a) 10 units
- b) 16 units
- c) 40 units
- d) 80 units

21. If EOQ = 1,000 units, order costs are £ 200 per order, and sales total 5,000 units, what is the carrying cost per units?

- a) £2
- b) £10
- c) £100
- d) £1,000

22. The credit policy of Milwaukee Brewski Breweries is 1/10, net 30. At present 25% of the customers take the discount. What would accounts receivable be if all customers took the cash discounts?

- a) Account receivable would be lower than the present level.
- b) No change from the present level.
- c) Account receivable would be higher than the present level.
- d) Unable to determine without more information.

23. Eclipse Ellipticals Inc. is considering a change in their credit terms. The firm is considering offering a 1.5% discount. Most likely competitors will follow suit, so sales will remain at £1 million and 40% of sales will be eligible to take advantage of the discount. The firm anticipates that receivables will be reduced by £30,000 and the firm has an opportunity cost of 18%. Should the firm change its credit terms?

- a) Yes
- b) No
- c) It does not really matter as the benefits and costs are identical.
- d) It cannot be determined from the given information.

24. The budgeted sales for the next four quarters are ₦192,000, ₦288,000, ₦288,000 and ₦336,000 respectively. It is estimated that sales will be paid for as follows:

75% of the total will be paid in the quarter that sales were made. Of the balance 50% will be paid in the quarter after the sale was made. The remaining 50% will be paid in the quarter after this. The amount of cash received in the third quarter will be:

- a) ₦276,000
- b) ₦324,000
- c) ₦240,000
- d) ₦144,000

25. Which of the following will not appear in a cash budget?

- a) Machinery bought on hire purchase
- b) Depreciation of machinery
- c) Wages
- d) Sales revenue.

## SECTION B

1. Firm Havannah is the parent company of Firms ODIN and OLIM. Both ODIN and OLIM have just presented their end of year financials to their parent company. As part of the consultative process to strategize for the coming year, you have been hired as an external consultant to identify, using Du Pont analysis, the main drivers of profitability of each subsidiary. You are also to compare the mode used by each firm for achieving its ROE level and advise on the pros and cons of using that approach .

Specifically, firm Havannah requires that you base your analysis on the three-point Du Pont formula. (10 marks). (Use Table 1)

Table 1

| ODIN    |         |                 |        | OLIM    |         |                 |        |
|---------|---------|-----------------|--------|---------|---------|-----------------|--------|
| Assets  | ₵       | Liab            | ₵      | Assets  | ₵       | Liab            | ₵      |
| Current | 20,000  | Current         | 15,000 | Current | 35,000  | Current         | 10,000 |
|         |         | Long-term       | 43,000 |         |         | Long-term       | 10,000 |
| Fixed   | 53,000  | Equity          | 15,000 | Fixed   | 55,000  | Equity          | 60,000 |
| Total   | 73,000  | Tot. Liab & Eq. | 73,000 |         |         | Tot. Liab & Eq. | 80,000 |
|         |         |                 |        |         |         |                 |        |
| Sales   | 146,000 | Net Income      | 14,000 | Sales   | 160,000 | Net Income      | 59,200 |

2. Your Uncle recently informed you of his desire to set up a school. He comes up with the following tentative estimates and wants your financial advice. He estimates that annual fixed costs for the school will amount to Gh₵300,000 inclusive of rental charges, salaries etc. Of the tuition fee per head to be charged per annum, he estimates that 15% will go into providing instruction materials which can directly costed per student. (16 marks Total)
- He wants you to advise him on the number of students he needs to breakeven if he pegs tuition per head per annum at Gh₵1,000. (Round to the nearest whole number)
  - He would also like to know how many students he needs in order to rake in an annual profit of Gh₵108,000 if tuition remains unchanged.
  - If he plans to maintain small class sizes in his school and hence works with a total student population of 280, will he lose, breakeven or make a profit? In the case of a profit or loss, indicate the amount.
  - If he insists on keeping his student population at 300, what minimum tuition fee should he charge in order to breakeven? (Round to the nearest whole number).

3. Alpha Tea Incorporated wants you to help prepare Proforma Financial statements for the year 2017. They plan to increase 2016 sales by 15% for 2017. Sales for 2016 is given as Gh₵60,000. They also plan to maintain their net profit margin and their dividend payout ratio at 20% and 50% respectively, all things being equal. To facilitate your work, they provide you with the following information.

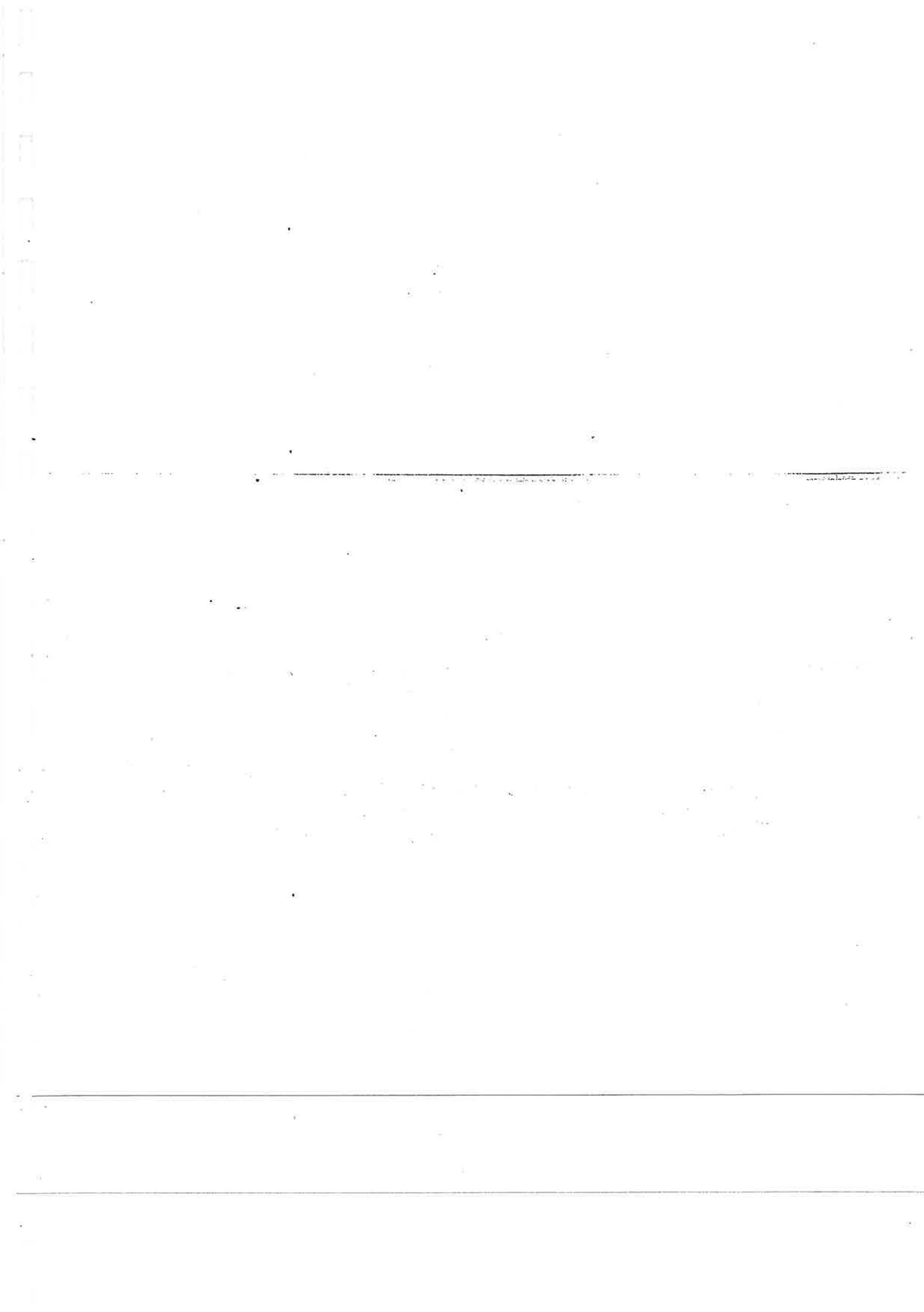
**Table 2:**

| Assets              | ₵              | Liab. & Equity                  | ₵              |
|---------------------|----------------|---------------------------------|----------------|
| Current Assets      | 45,000         | Accounts Payable                | 25,000         |
|                     |                | Notes Payable                   | 10,000         |
| Fixed Assets        | 62,000         | Long-term Debt                  | 22,000         |
|                     |                | Equity                          | 50,000         |
| <b>Total Assets</b> | <b>107,000</b> | <b>Total Liab. &amp; Equity</b> | <b>107,000</b> |

**Required:**

Determine Excess or additional financing, if any, and advise Alpha Tea on all options available to make the balance sheet balance. (14 marks)

4. We have a GHS 500,000 line of credit with a 15% compensating balance requirement. The quoted interest rate is 9%. We need to borrow GHS150,000 for inventory for one year.
- How much do we need to borrow? (3 Marks)
  - What cedi interests are paying on the facility? (2 marks)
  - What interest rate are we effectively paying on the facility? (5marks)
5. Mr. Smart heard about the Ghana Government's 'Smart Borrowing' concept under the new debt management strategy and borrowed GH₵ 15,000 to have a successful wedding and he wants to pay off the loan in 12 monthly instalments otherwise the bank will come for his wife and children born to them since they were pledged as collateral for the loan.



6. During a certain week, the discount on a 91-Day Treasury Bill with a face value of GH¢200 was GH¢ 15 (5 Marks)
- a. What should the monthly repayments be if the annual interest rate is 18%? (5 marks)
- b. Prepare an amortization schedule demonstrating the flow of transactions for the first five (5) months of the payment (5 Marks)
- c. What is the simple annualised yield?
- d. What is the standard deviation of this 91-day Treasury Bill
- e. The return on Treasury Bill is meant principally to compensate investors for two things, what are they?



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**B.SC ADMINISTRATION, FIRST SEMESTER EXAMINATIONS:**  
**2015/2016**

**FINC 301: INTRODUCTION TO BUSINESS FINANCE (3 Credits)**

**INSTRUCTIONS**

1. This is a closed book exam
2. You are to provide all answers in the answer booklet provided
3. Answers to section A should all be on page one (1) of the booklet provided
4. You are permitted to use calculators
5. You are to attempt all questions
6. Show all relevant calculations where needed
7. You are to return the question papers

**Two and half (2 1/2) HOURS**

## SECTION A (75 marks)

### Part One (1)

State whether each of the following statements is True (T) or False (F) in your answer booklet.

1. If current assets are \$20,000, where inventory is \$5,000, and total liabilities are \$50,000, the current ratio is 0.40.
2. Tom invests \$1000 to start a new firm. He knows that the debt to total assets ratio will be 0.40. Tom also expects a net profit margin of 9% and a total asset turnover rate of 2. Tom should expect a return on equity of 30%
3. Cash planning is a part of long-term financial planning
4. If the net profit margin for a firm is 11.2% and the net earnings are \$83,000, then the sales must be \$741,071.
5. Mae Jones runs a small convenience store, which is open every day. Her annual sales are \$600,000, of which 75% are cash sales. If she wants to obtain a 10-day average collection period, her average accounts receivable balance must be \$4,110.
6. The more debt a company has the worse the company is.

### Part 2

Note: Write the letter that corresponds to your answer in the answer booklet.

7. Net profit ratio signifies
  - a. dividends for shareholders
  - b. operational profitability
  - c. liquidity position
  - d. profit for lenders

8. Which of the following can be inferred from rising costs of goods sold (COGS) as a percentage of sales?
- i. Sales revenue is increasing
  - ii. Contribution margin per unit is declining
  - iii. The firm's supply source is becoming a competitive disadvantage
- a. i only  
b. ii only  
c. i and iii  
d. ii and iii

9. The ratio of Net income to number of equity shares known as:

- a. Price earnings ratio
- b. Net profit ratio
- c. Earnings per share
- d. Dividend per share

10. Gross Profit Ratio for a firm remains same but the Net Profit Ratio is decreasing.

The reason for such behavior could be:

- a. Increase in Costs of Goods Sold,
- b. Increase in Expense,
- c. Increase in Dividend,
- d. Decrease in Sales.

11. During year 1, the sales and Cost of goods sold were Ghs.600,000 and Ghs. 430,000 respectively. Next year, the sales are expected to increase by 10%. The Cost of goods sold for next year would be:

- a. Ghs 430,000,
- b. Ghs. 490,000,
- c. Ghs. 473,000,
- d. Ghs.440,000.

12. The order of priority for claims if a firm must be liquidated is

- a. Preferred stock, senior debt, subordinated debt, common stock
- b. Preferred stock, common stock , senior debt, subordinated debt
- c. senior debt, subordinated debt, preferred stock, common stock
- d. senior debt, preferred stock, subordinated debt, common stock

13. Which of the following describes a securities' offering in which an existing shareholder sells a large block of stock to new investors?

- a. Equity carve-out
- b. Primary offering
- c. Secondary offering
- d. Negotiated offering

14. Determine a firm's total asset turnover (TAT) if its net profit margin (NPM) is 5 percent, total assets are \$8 million, and ROA is 8 percent

- a. 1.60
- b. 2.05
- c. 2.50
- d. 4.00

15. When a company borrows to finance its projects, all else equal

- a. Its profitability increases
- b. It improves its solvency position
- c. Its liquidity position improves
- d. Its financial risk increases

16. One of the tasks for financial managers when identifying projects that increase firm value is to identify those projects where

- a. marginal benefits are at least equal to the project's marginal costs.
- b. taking the project will increase the book value of the firm's common stock.
- c. taking the project will decrease the book value of the firm's debt outstanding.
- d. none of the above

17. which form of invested capital is subject to most of the firm's business and financial risk?

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BACHELOR OF SCIENCE IN ADMINISTRATION

DEPARTMENT OF MARKETING AND ENTREPRENEURSHIP

MKTG 303: INTRODUCTION TO ELECTRONIC BUSINESS (3 CREDITS)

FIRST SEMESTER EXAMINATION 2018/2019 (LEVEL 300)

TIME ALLOWED: TWO (2) HOURS

**INSTRUCTIONS: - ANSWER ALL QUESTIONS ON THE QUESTION PAPER**

**SECTION A**

Circle the letter that corresponds with the appropriate answer

1. Starbucks.com is an example of \_\_\_\_.
  - a. public e-marketplace
  - b. government e-marketplace
  - c. private e-marketplace
  - d. third party e-marketplace
2. Which of the following pairs are examples of bookmarking and content curation networks?
  - a. Facebook and Instagram
  - b. Pinterest and Flipboard
  - c. YouTube and Snapchat
  - d. Twitter and LinkedIn
3. Under which of the following technological phases does social commerce fall.
  - a. Web 1.0
  - b. Web 2.0
  - c. Web 3.0
  - d. Web 4.0
4. \_\_\_\_ are recognized but unofficial experts in certain domains/fields who can provide both positive or negative recommendations to advice seekers.
  - a. Guides
  - b. Collaborators
  - c. Syndicators
  - d. Mavens
5. Phishers use \_\_\_\_ techniques to deceive users in downloading malware.
  - a. Social network
  - b. Social media
  - c. Social engineering
  - d. Social pages

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6. M2M means \_\_\_\_\_.  
a. Management-to-Management  
b. Machine-to-Management  
c. Machine-to-Machine  
d. Management-to-Machine
7. A \_\_\_\_\_ cannot be used as an electronic payment system.  
a. PlaceCast  
b. Bitcoin  
c. VISA  
d. MasterCard
8. The term WAP means \_\_\_\_\_.  
a. Wireless Assistant Protocol  
b. Wireless Application Protocol  
c. Wireless Area Protocol  
d. None of the above
9. Which of these are classified as a Business-Oriented social network.  
a. LinkedIn  
b. Facebook  
c. Twitter  
d. WhatsApp
10. Which of the following can best replace ubiquitous computing (ubicom)?  
a. stationary computing  
b. catchment computing  
c. intrusive computing  
d. pervasive computing
11. WAP means \_\_\_\_\_.  
a. Wireless Assistant Protocol  
b. Wireless Application Protocol  
c. Wireless Area Protocol  
d. None of the above
12. In electronic commerce, a POS refers to \_\_\_\_\_.  
a. payment-of-services  
b. purchase-outlet-system  
c. point-of-sale  
d. price-out-system
13. LEGO's co-creation system is not an example of crowdsourcing.  
a. True  
b. False
14. \_\_\_\_\_ in business are the standards of right and wrong.  
a. values  
b. morals  
c. logistics  
d. ethics

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15. Another name given to Botnet is \_\_\_\_\_.  
a. Zombie army  
b. Hijacking  
c. Heartbleed  
d. Crypto locker
16. Apple's iTunes music is a classic example of a \_\_\_\_\_ type of electronic business.  
a. brick-and-mortar  
b. pure EC  
c. partial EC  
d. shopping cart
17. Which of the following is not a type of broker service in electronic business?  
a. trading  
b. comparison agent  
c. community merchant  
d. matching service
18. A \_\_\_\_\_ provides an initial point of entry into the web, with specialized content and services.  
a. Syndicator  
b. Broker  
c. Portal  
d. Search bar
19. Blogs and Wikis are examples of platforms for \_\_\_\_\_.  
a. mobile commerce  
b. geographical commerce  
c. locational commerce  
d. social commerce
20. A scam where malicious code is installed on a computer and used to redirect victims to bogus websites without their knowledge or consent is called \_\_\_\_\_.  
a. phishing  
b. pharming  
c. worming  
d. fishing
21. A \_\_\_\_\_ refers to the manner in which business is done to generate revenue and create value for firms.  
a. business model  
b. business theory  
c. transaction framework  
d. capability
22. Which of the following is not true of social networking sites capabilities?  
a. Consumers cannot rate and comment on products and services  
b. Wikis can be used to jointly create documents  
c. They support photo and video sharing  
d. Emailing and instant messaging (IM) are possible
23. \_\_\_\_\_ refers to mobile applications used by companies to improve the operations of employees, facilities and relevant supply chains.  
a. App store  
b. Play store

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- c. Mobile venture
  - d. Mobile enterprise
24. Among the list below, \_\_\_\_\_ is not a social shopping network.
- a. Fancy
  - b. Etsy
  - c. Polyvore
  - d. Airbnb
25. Cyberespionage refers to an authorized spying a computer system.
- a. True
  - b. False
26. Which is the least in descending order of importance among the following security attacks.
- a. botnets
  - b. malware
  - c. spam
  - d. spyware
27. Which of the following is not related to cybercrimes?
- a. Trojans
  - b. phishing
  - c. encryption
  - d. pharming
28. The use of data mining techniques on the internet to discover patterns and hidden relationships is termed as \_\_\_\_\_.
- a. Web mining
  - b. Web bugging
  - c. Viral marketing
  - d. E-relationships
29. Which of the following is not a sensory input describing Augmented Reality?
- a. GPS data
  - b. graphics
  - c. none of the options listed
  - d. audio-visuals
30. The final step in the online purchasing-decision model is \_\_\_\_\_.
- a. purchase delivery
  - b. post-purchase activities
  - c. evaluation of alternative
  - d. information search
31. \_\_\_\_\_ is the second generation of Internet-based tools and services that enables users to easily generate content and share media in innovative ways.
- a. collaborators
  - b. generation 2 systems
  - c. avatars
  - d. web 2.0

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32. Kenya's M-PESA is an example of \_\_\_\_\_.  
a. mobile positioning system  
b. mobile payment system  
c. mobile shopping app  
d. merchant persuasion app
33. In social commerce, \_\_\_\_ are people with contacts that introduce people to each other.  
a. Connectors  
b. Seekers  
c. Mavericks  
d. Classifieds
34. GPS is a utility that provides users with positioning, navigation and timing services. It is an abbreviation for \_\_\_\_\_.  
a. geographical positioning system  
b. global pointing system  
c. geolocation pointer service  
d. global positioning system
35. Which of the following is not a technological limitation of e-commerce?  
a. internet accessibility  
b. software development tools  
c. insufficient telecommunication bandwidth  
d. resistance to change
36. Which of the following defines a blog created by spammers for the purposes of advertising?  
a. Spadvert  
b. Keystroke  
c. Vlog  
d. Splog
37. Online activities and communications done by parties working to attain the same goal describes \_\_\_\_\_.  
a. Intercoms  
b. social networks  
c. collaborative commerce  
d. digital selling
38. Which of the following is not an attribute of mobile commerce?  
a. convenience  
b. ubiquity  
c. localization  
d. non-personalization
39. Electronic transactions that take place between and among organisations are \_\_\_\_\_.  
a. B2A  
b. B2C  
c. B2B  
d. B2G
40. Social computing refers to computing systems that involve social interactions.  
a. True  
b. False

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41. PDA in electronic commerce may best be described as \_\_\_\_\_?

- a. portable digital associate
- b. personal digital assistant
- c. portable digital assistant
- d. personal digital associate

42. A \_\_\_\_\_ economy is one that is based on online transactions, mostly e-commerce.

- a. dynamic
- b. reserved
- c. subsistence
- d. digital

43. Uber transportation services are typical examples of \_\_\_\_\_.

- a. L-commerce
- b. M-commerce
- c. H-Commerce
- d. Gamification

44. An electronic retail transaction of products and services from businesses to individual shoppers is an example of \_\_\_\_\_.

- a. B2A
- b. B2B
- c. B2C
- d. G2C

45. A \_\_\_\_\_ aggregates content or applications to resell as package to third party websites.

- a. portal
- b. content provider
- c. virtual storefront
- d. syndicator

46. Which of the following best describes a PDF document?

- a. protected document file
- b. printable document file
- c. protected document format
- d. portable document format

47. The benefits, including the intangible ones, that a company hopes to derive from using its business model is termed as \_\_\_\_\_.

- a. service aim
- b. value proposition
- c. model bouquet
- d. derivative promise

48. A company that helps in online shopping via the provision of escrow, shipping and security may be a \_\_\_\_\_.

- a. shopping aid provider
- b. comparison agent
- c. community merchant
- d. matching service provider

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49. PriceGrabber provides product pricing and availability information. This is an example of

- a. transaction broker.
  - b. information broker
  - c. virtual broker
  - d. content provider

50. In social shopping, \_\_\_\_\_ are created by users who may be experienced consumers, experts, or employees.

- a. mavens
  - b. journalists
  - c. guides
  - d. mavericks

**SECTION B – ANSWER ANY ONE QUESTION ONLY FROM THIS SECTION**

1. Social media marketing has become an indispensable component of electronic marketing. As a digital consultant for a Ghanaian firm, discuss any *six* activities firms can undertake in the social media space. (**20 marks**)
  2. As a digital associate for Brinnomark Inc., you have been tasked to help the company migrate onto electronic platforms. Discuss any three (3) benefits of electronic business each for the organization and for customers. (**20 marks**).

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UNIVERSITY OF GHANA

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BACHELOR OF SCIENCE IN ADMINISTRATION

DEPARTMENT OF MARKETING AND ENTREPRENEURSHIP

MKTG 303: INTRODUCTION TO ELECTRONIC BUSINESS (3 CREDITS)

FIRST SEMESTER EXAMINATION 2017/2018 (LEVEL 300)

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: SECTION A – ANSWER ALL QUESTIONS

Circle the letter that corresponds with the appropriate answer

1. LEGO's co-creation system is not an example of crowdsourcing.
  - a. True
  - b. False
2. \_\_\_\_\_ in business are the standards of right and wrong.
  - a. values
  - b. morals
  - c. logistics
  - d. ethics
3. Apple's iTunes is a classic example of a \_\_\_\_\_ type of electronic business.
  - a. brick-and-mortar
  - b. pure EC
  - c. partial EC
  - d. shopping cart
4. Which of the following is not a type of broker service in electronic business?
  - a. trading
  - b. comparison agent
  - c. community merchant
  - d. matching service
5. A \_\_\_\_\_ cannot be used as an electronic payment system.
  - a. PlaceCast
  - b. Bitcoin
  - c. VISA
  - d. MasterCard
6. A \_\_\_\_\_ provides an initial point of entry into the web, with specialized content and services.
  - a. Syndicator
  - b. Broker
  - c. Portal
  - d. Search bar

7. Blogs and Wikis are examples of platforms for \_\_\_\_\_.  
a. mobile commerce  
b. geographical commerce  
c. locational commerce  
d. social commerce
8. A scam where malicious code is installed on a computer and used to redirect victims to bogus websites without their knowledge or consent is called \_\_\_\_\_.  
a. phishing  
b. pharming  
c. worming  
d. fishing
9. A \_\_\_\_\_ refers to the manner in which business is done to generate revenue and create value for firms.  
a. business model  
b. business theory  
c. transaction framework  
d. capability
10. Which of the following is not true of social networking sites capabilities?  
a. Consumers cannot rate and comment on products and services  
b. Wikis can be used to jointly create documents  
c. They support photo and video sharing  
d. Emailing and instant messaging (IM) are possible
11. Among the list below, \_\_\_\_\_ is not a social shopping network.  
a. Fancy  
b. Etsy  
c. Polyvore  
d. Airbnb
12. Which is the least in descending order of importance among the following security attacks.  
a. botnets  
b. malware  
c. spam  
d. spyware
13. *Cyberespionage* refers to an authorized spying a computer system.  
a. True  
b. False
14. Which of the following is not related to cybercrimes?  
a. Trojans  
b. phishing  
c. encryption  
d. pharming
15. \_\_\_\_\_ refers to mobile applications used by companies to improve the operations of employees, facilities and relevant supply chains.  
a. App store  
b. Play store  
c. Mobile venture  
d. Mobile enterprise

16. \_\_\_\_\_ are recognized, but are unofficial experts in certain domains/fields who can provide both positive or negative recommendations to advice seekers.
- Guides
  - Collaborators
  - Syndicators
  - Mavens
17. The use of data mining techniques on the internet to discover patterns and hidden relationships is termed as \_\_\_\_\_.
- Web mining
  - Web bugging
  - Viral marketing
  - E-relationships
18. Which of the following is not a sensory input describing Augmented Reality?
- GPS data
  - graphics
  - none of the options listed
  - audio-visuals
19. The final step in the online purchasing-decision model is \_\_\_\_\_.
- purchase delivery
  - post-purchase activities
  - evaluation of alternative
  - information search
20. \_\_\_\_\_ is the second generation of Internet-based tools and services that enables users to easily generate content and share media in innovative ways.
- collaborators
  - generation 2 systems
  - avatars
  - web 2.0
21. M-PESA in Kenya is an example of \_\_\_\_\_.
- mobile positioning system
  - mobile payment system
  - mobile shopping app
  - merchant persuasion app
22. In social commerce, \_\_\_\_\_ are people with contacts that introduce people to each other.
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  - Seekers
  - Mavericks
  - Classifieds
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  - geolocation pointer service
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  - Keystroke
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  - Splog
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  - social networks
  - collaborative commerce
  - digital selling
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  - ubiquity
  - localization
  - non-personalization
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  - B2C
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  - B2G
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- portable digital associate
  - personal digital assistant
  - portable digital assistant
  - personal digital associate
30. A \_\_\_\_\_ economy is one that is based on online transactions, mostly e-commerce.
- dynamic
  - reserved
  - subsistence
  - digital
31. Under which of the following technological phases does social commerce fall.
- Web 1.0
  - Web 2.0
  - Web 3.0
  - Web 4.0
32. Uber transportation services are typical examples of \_\_\_\_\_.
- L-commerce
  - M-commerce
  - H-Commerce
  - Gamification

33. An electronic retail transaction of products and services from businesses to individual shoppers is an example of \_\_\_\_\_.  
a. B2A  
b. B2B  
c. B2C  
d. G2C
34. A \_\_\_\_\_ aggregates content or applications to resell as package to third party websites.  
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c. virtual storefront  
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b. printable document file  
c. protected document format  
d. portable document format
36. The benefits, including the intangible ones, that a company hopes to derive from using its business model is termed as \_\_\_\_\_.  
a. service aim  
b. value proposition  
c. model bouquet  
d. derivative promise
37. Which of the following can best replace ubiquitous computing (ubicom)?  
a. stationary computing  
b. catchment-computing  
c. intrusive computing  
d. pervasive computing
38. \_\_\_\_\_ is not a descriptive characteristic of an avatar in a virtual world?  
a. animated  
b. computerized  
c. animated  
d. robotic
39. In electronic commerce, a POS refers to \_\_\_\_\_.  
a. payment-of-services  
b. purchase-outlet-system  
c. point-of-sale  
d. price-out-system
40. A company that helps in online shopping via the provision of escrow, shipping and security may be a \_\_\_\_\_.  
a. shopping aid provider  
b. comparison agent  
c. community merchant  
d. matching service provider

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41. Starbucks.com is an example of \_\_\_\_.

- a. public e-marketplace
- b. government e-marketplace
- c. private e-marketplace
- d. third party e-marketplace

42. Which of the following pairs are examples of bookmarking and content curation networks?

- a. Facebook and Instagram
- b. Pinterest and Flipboard
- c. YouTube and Snapchat
- d. Twitter and LinkedIn

43. Pricegrabber provides product pricing and availability information. This is an example of \_\_\_\_\_.

- a. transaction broker.
- b. information broker
- c. virtual broker
- d. content provider

44. In social shopping, \_\_\_\_\_ are created by users who may be experienced consumers, experts, or employees.

- a. mavens
- b. journalists
- c. guides
- d. mavericks

45. Social computing refers to computing systems that involve social interactions.

- a. True
- b. False

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**SECTION B – ANSWER ALL QUESTIONS**

1. State any four (4) properties that can help differentiate between e-commerce and social commerce (4 marks).

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2. Briefly explain *Phishing* in electronic commerce? (3 marks)

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3. Outline any six (6) types of Internet business models. (6 marks)

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4. Distinguish between a webstore and an electronic mall. (4 marks)

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5. Mention five (5) possible real-time activities of Location-based commerce. (5 marks)

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6. Identify the three (3) parameters that distinguish pure ECs from partial EC. (3 marks)

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BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION  
DEPARTMENT OF MARKETING AND ENTREPRENEURSHIP  
MKTG 303: INTRODUCTION TO ELECTRONIC BUSINESS  
FIRST SEMESTER EXAMINATION 2016/2017

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INSTRUCTIONS: ANSWER ALL QUESTIONS IN SECTION A AND ANY TWO QUESTIONS IN SECTION B

TIME ALLOWED: TWO AND HALF (2 ½) HOURS

SECTION A – ANSWER ALL QUESTIONS IN THIS SECTION

1. Briefly explain any eight (8) internet business models adopted by firms via the internet.  
(8 marks)
2. Distinguish between E-business and E-commerce (2 marks).
3. Identify any six (6) basic types of E-commerce and give an example of each type.  
(6 marks)
4. State the three (3) major business pressure categories acting as driving forces to electronic business. (3 marks)
5. Mention, in chronological order, the six (6) stages involved in the online buying process.  
(6 marks)
6. State five (5) factors influencing internet-based advertising design. (5 marks)

## **SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION**

1. Within the context of electronic business discuss how the DRAMA approach to E-CRM could help online businesses manage their relationships with customers. (20 marks)
2. Using Porter's 5-Forces model, discuss the effect of each force in electronic business markets. (20 marks)
3. Identify a service industry of your choice and discuss any three benefits and three challenges associated with their e-business adoption and usage. (20 marks)



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MAIN CAMPUS AND CITY CAMPUS

B.SC. ADMIN. FIRST SEMESTER EXAMINATIONS: 2014/2015

MKTG 303 INTRODUCTION TO ELECTRONIC BUSINESS (3 Credits)

INSTRUCTION:

*ANSWER ANY FOUR QUESTIONS*

TIME ALLOWED:

*Two Hours and Forty-five Minutes (2 Hours 45 minutes)*

QUESTION 1

Identify one problem with the website of the President of Ghana or any governmental agency and discuss two strategies to address the problem.

(25 marks)

QUESTION 2

The University of Ghana intends to develop a twitter page for its marketing communications. Discuss four potential unintended consequences of having a twitter page.

(25 marks)

QUESTION 3

The Ghanaian website Tonaton.com allows users to advertise and sell new and used products online. Discuss three ways Tonaton.com can reduce or eliminate quality uncertainty for users who use their website.

(25 marks)

QUESTION 4

Discuss the relevance and challenges of e-procurement to a Ghanaian Bookshop company, like Kingdom Bookshop.

(25 marks)

QUESTION 5

The Internet is the new competitive platform for business for retailers as well as other business types. Business models on the Internet vary, and so are the revenue models. With relevant examples from Ghana, examine any six (6) e-business models.

(25 marks)

QUESTION 6

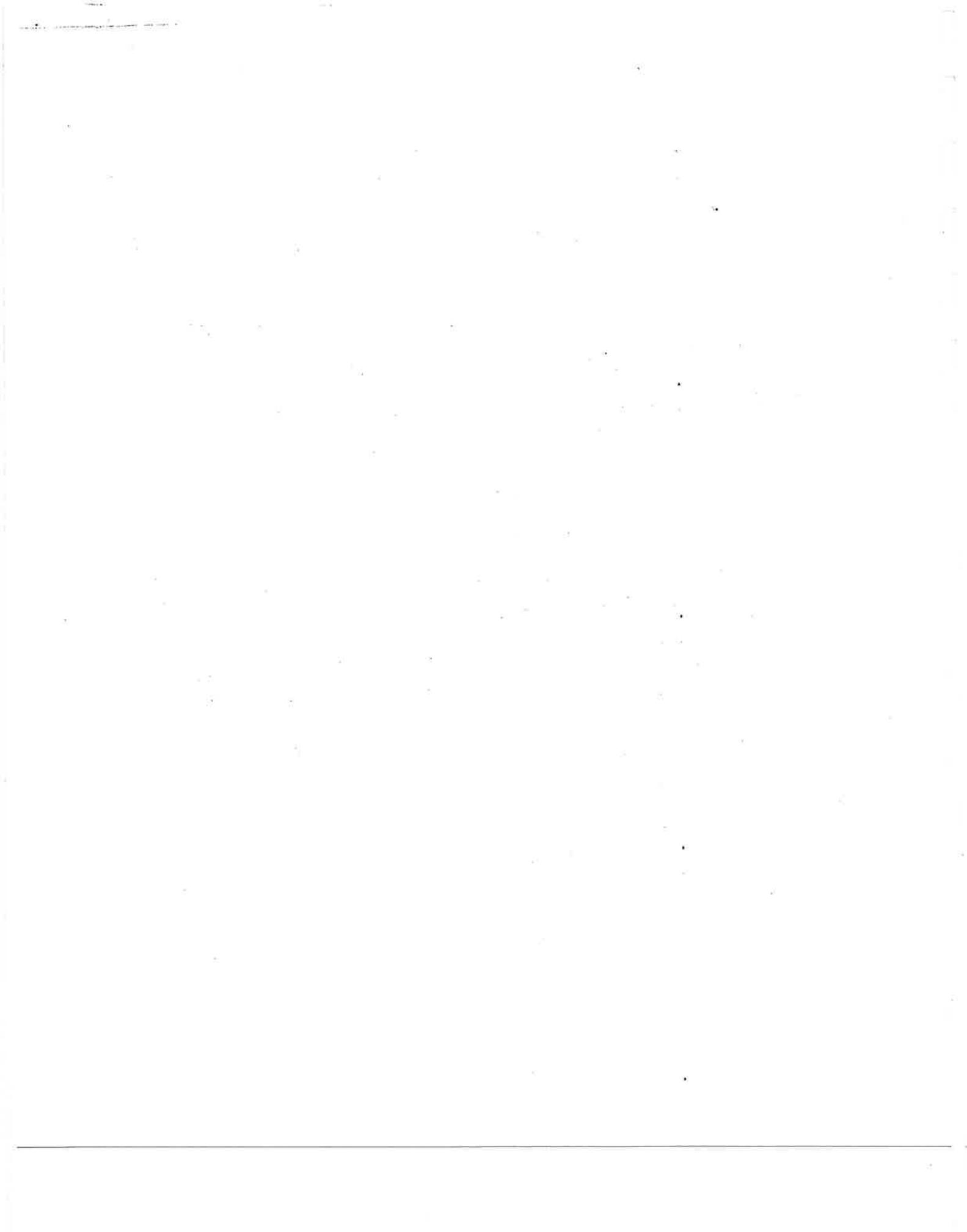
E-business is an innovation that has to be communicated and accepted by the Ghanaian business community overtime. Using the Whatsup as an example, explain the potential impact of social media on the business of a trader, tailor or seamstress in Accra.

(25 marks)

QUESTION 7

Rural and Community banks are usually hesitant in Internet banking for their customers or clients. Discuss three reasons why these types of banks are yet to deploy Internet banking.

(25 marks)





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## BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

### DEPARTMENT OF MARKETING AND ENTREPRENEURSHIP

#### MKTG 303: INTRODUCTION TO ELECTRONIC BUSINESS

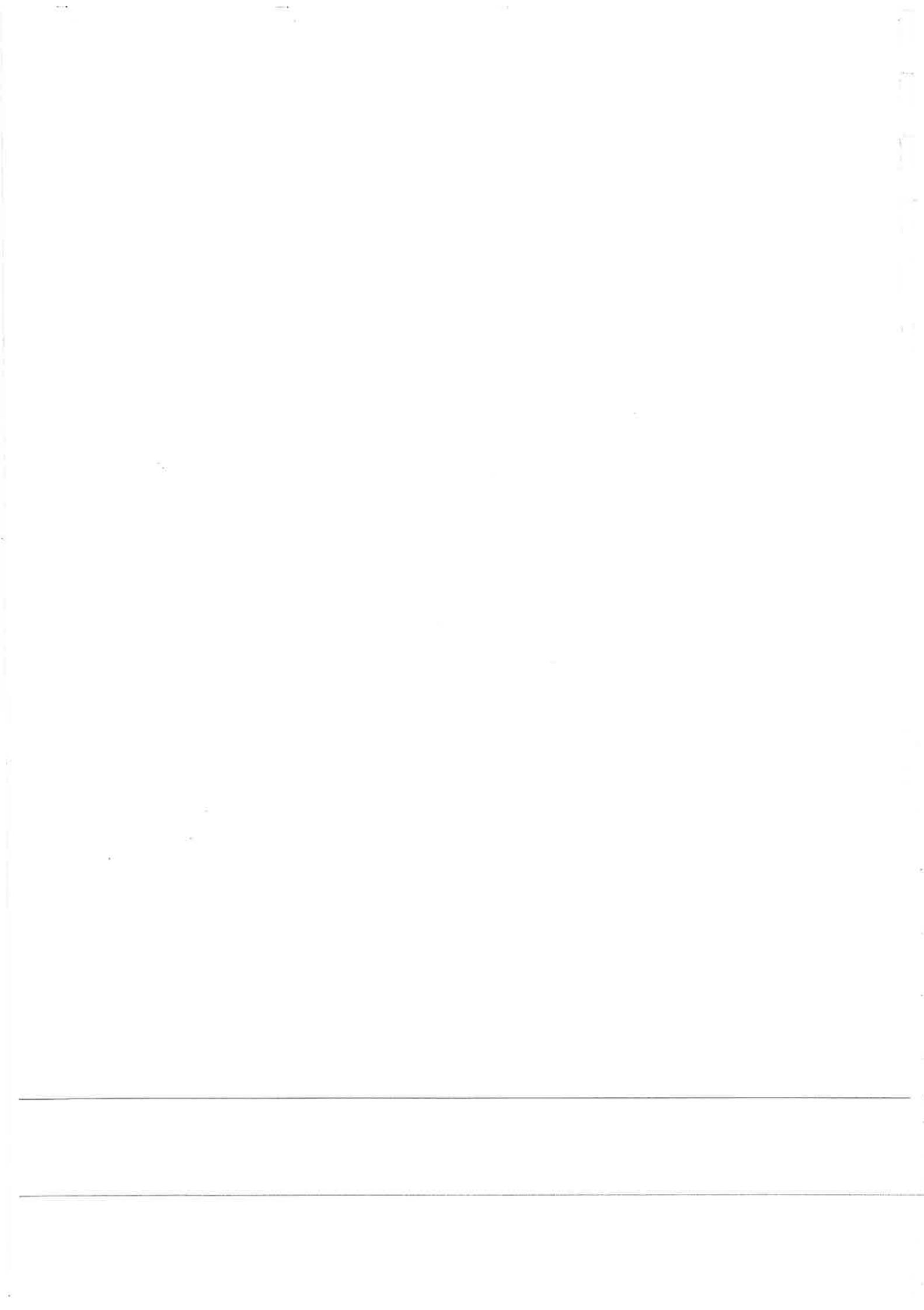
FIRST SEMESTER EXAMINATIONS 2015/2016

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INSTRUCTIONS: ANSWER ANY THREE QUESTIONS

TIME ALLOWED: TWO AND HALF ( $2\frac{1}{2}$ ) HOURS

1. In the context of electronic business, explain eight (8) distinguishing characteristics between the old and the new economy. (25)
2. How would you explain electronic data interchange (EDI) and five (5) benefits of it to students from second cycle institution who are on a visit to the University of Ghana? (25 Marks)
3. Mention and explain five (5) key drivers of the growth and development of the mobile wireless industry. (25 Marks)
4. Identify and explain five (5) advantages of the internet in channel functions. (25 Marks)
5. Explain with appropriate examples, the concepts of disintermediation and reintermediation. (25 Marks)
6. Firms engaged in e-business have been able to reduce the transaction costs at one or more stages of the buying and selling process. Mention and explain six (6) types of transaction costs. (25 Marks)





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CITY CAMPUS

B.SC ADMIN. FIRST SEMESTER EXAMINATIONS: 2013/2014  
DEPARTMENT OF MARKETING AND CUSTOMER MANAGEMENT

MKTG 303 Introduction to Electronic Business (3 Credits)

INSTRUCTION:

*Answer All Questions in Section A and One Question in Section B*

TIME ALLOWED:

*Three Hours (3 hours)*

QUESTION 1

The Radio network, Joy FM has a plethora of web services including Joy Market, Myjoyonline, Joy FM on Facebook and Joy FM on Youtube. One can say that the radio network is engaged in both e-business and e-commerce. Is this true? Using examples explain your position.

(30 marks)

QUESTION 2

Stolen Credit Cards Numbers Leaked

In what may be the largest credit card heist on the Internet, an 18-year-old Russian cracker claims to have stolen thousands of credit card numbers from an online store (Jacques) and dispensed them to visitors of his Web site. Before it was taken offline early Sunday morning, the rogue site, a page of which has been captured here, had doled out more than 25,000 stolen card numbers. Also included with the numbers were expiration dates and cardholder names and addresses.

Identify the three requirements of information security and discuss any two requirements which have been breached in the Case Study.

(30 marks)

QUESTION 3

So many websites are going social, what does it mean and how can the University of Ghana website be made social?

(20 marks)

**SECTION B**  
*Answer Only One Question*

**QUESTION 4**

Explain the concept of e-procurement and discuss three challenges of e-procurement in a developing country like Ghana.

(20 marks)

**QUESTION 5**

Explain the concept of e-banking and discuss three challenges of e-banking in a developing country like Ghana.

(20 marks)



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FIRST SEMESTER BSc. ADMINISTRATION EXAMINATIONS: 2018/2019

UGBS 301: QUANTITATIVE METHODS (3 credits)

TIME ALLOWED: THREE (3) HOURS

**INSTRUCTIONS:** Answer ALL questions from both section A and section B. All questions must be answered on the question sheet. Carefully plan your answers to fit the spaces provided. Relevant formulae and tables are provided. No credit will be given for an answer with no work shown.

**Section A (25 marks):** This section contains 10 multiple choice questions. Show your work in the space provided. Each question carries 2.5 marks.

1. A house cleaning service claims that it can clean a four-bedroom house in less than 2 hours. A sample of  $n = 16$  houses is taken and the sample mean is found to be 1.97 hours and the sample standard deviation is found to be 0.1 hours. Using a 0.05 level of significance the correct conclusion is:

- a) Do not reject the null hypothesis.
- b) Reject the null hypothesis.
- c) The sample mean is not 2 hours.
- d) The sample mean is 2 hours.
- e) None of the above

2. What is the optimal decision, and the objective value of the following linear programming problem?

$$\begin{aligned} P &= \text{Max } 7x_1 + 6x_2 \\ \text{s.t.} \quad &3x_1 + x_2 \leq 21 \\ &x_1 + x_2 \leq 10 \\ &x_1 + 2x_2 \leq 12 \\ &x_1, x_2 \geq 0 \end{aligned}$$

- 
- a)  $x_1 = 5.5, x_2 = 4.5, P = 65.5$
  - b)  $x_1 = 6, x_2 = 4, P = 66$
  - c)  $x_1 = 8, x_2 = 2, P = 68$
  - d) at  $x_1 = 6, x_2 = 3, P = 60$
  - e)  $x_1 = 2, x_2 = 8, P = 62$

3. Which of the following is true with respect to the binomial distribution?

- a) The binomial distribution becomes more skewed as the sample size is increased for a given probability of success.
- b) The binomial distribution tends to be more symmetric as  $p$  approaches 0.5.
- c) As the sample size increases, the expected value of the random variable decreases.
- d) For the binomial distribution to be skewed, the sample size must be quite large.
- e) The binomial distribution becomes a normal distribution for a sample size of 5.

4. The manager at a local movie theater has collected data for a long period of time and has concluded that the revenue from concession sales during the first show of each evening is normally distributed with a mean of GH¢336.25 and a variance equal to GH¢1,456. Based on this information, what are the chances that the revenue from the first show will exceed GH¢800?

- a) 0.1255
- b) 0.3745
- c) Essentially zero
- d) 0.9999
- e) 0.8752

5. Assuming that the change in daily closing prices for stocks on the New York Stock Exchange is a random variable that is normally distributed with a mean of \$0.35 and a standard deviation of \$0.33. Based on this information, what is the probability that a randomly selected stock will close up \$0.75 or more?

- a) 0.1131
- b) 0.7100
- c) 0.8869
- d) 0.3869
- e) 0.921

6. The number of visible defects on a product container is thought to be Poisson distributed with a mean equal to 3.5. Based on this, how many defects should be expected if 3 containers are inspected?

- a) Between 4 and 7
- b) 3.5
- c) Approximately 3.24
- d) 10.5
- e) 15.1

7. Consider the following partially completed computer printout for a regression analysis where the dependent variable is the price of a personal computer and the independent variable is the size of the hard drive.

| Regression Statistics |         |             |             |   |                |
|-----------------------|---------|-------------|-------------|---|----------------|
| Multiple R            | 0.81936 |             |             |   |                |
| R Square              |         |             |             |   |                |
| Adjusted R Square     | 0.66169 |             |             |   |                |
| Standard Error        |         |             |             |   |                |
| Observation           | 36      |             |             |   |                |
| ANOVA                 |         |             |             |   |                |
|                       | df      | SS          | MS          | F | Significance F |
| Regression            | 1       | 33116034.84 | 33116034.84 |   |                |
| Residual              |         | 16211214.72 |             |   |                |
| Total                 | 35      | 49327249.56 |             |   |                |

Based on the information provided, what percentage of the variation in the price of the personal computers is accounted for by the regression model using hard drive capacity as the independent variable?

- a) 67.13%      b) 217.75%      c) 82%      d) 66.17%      e) 81.94%

8. Which of the following is/are true of linear programming?

- i. For a maximization problem, an optimal solution to an LP is a point in the feasible region with the largest objective function value.
  - ii. The feasible region for an LP is the set of all points that satisfies all the LP's constraints and sign restrictions.
  - iii. A constraint is binding if the left-hand side and the right-hand side of the constraint are equal when the optimal values of the decision variables are substituted into the constraint.
  - iv. A constraint is nonbinding if the left-hand side and the right-hand side of the constraint are unequal when the optimal values of the decision variables are substituted into the constraint
  - v. The reduce cost is the increase in objective function value due to a unit increase in the RHS value of a constraint.
- a) i, ii, iii only    b) iii, iv, v only     c) i, ii, iii, iv only     d) i, ii, iii, v only     e) ii, iii only

9. A population of interest is approximately normally distributed. Construct a 95% confidence interval estimate for the population mean given the following values:

$$\bar{x} = 30, s = 5, n = 10$$

- a) (17.6, 22.4)   b) (26.4, 33.6)   c) (26.4, 30.6)   d) (28.1, 35.3)   e) (7.1, 9.3)

10. Suppose the unemployment rate in Ghana is 45%. A researcher randomly selected 150 people in Ghana. What is the expected number of people who are unemployed?

- a) 45      b) 35.5      c) 67.5      d) 85.5      e) 95.1

**SECTION B: Answer all three questions**

**Question 1**

a. If a real estate market is strong there will be a close relationship between the asking price for homes and the selling price. Suppose that one analyst believes that the mean difference between asking price and selling price for homes in a particular market is less than GH¢2,000. To test this using an alpha level equal to 0.05, a random sample of  $n = 15$  homes that have been sold recently was selected. The sample differences between the asking price and selling price (in GH¢) are in the following table:

|       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 2,053 | 1,693 | 1,854 | 1,747 | 869   |
| 1,396 | 2,473 | 1,931 | 2,303 | 1,502 |
| 1,038 | 2,755 | 2,084 | 1,664 | 2,104 |

- i. State the appropriate hypothesis test for the mean difference between asking and selling price of homes in an area if the mean difference is less than GH¢2000 (2 marks)

ii. Test the hypothesis in (i) above using an alpha level of 0.05. (10 marks)

b. A small city is considering breaking away from the county school system and starting its own city school system. City leaders believe that more than 60 percent of residents support the idea. A poll of  $n = 215$  residents is taken and 134 people say they support starting a city school district. Using a 0.10 level of significance, conduct a hypothesis test to determine whether this poll supports the belief of city leaders. (4 marks)

c. As a step in establishing its rates, an automobile insurance company is interested in determining whether there is a difference in the mean highway speeds that drivers of different age groups drive. To help answer this question, it has selected a random sample of drivers in three age categories: under 21, 21-50, and over 50. The engineers then recorded the drivers' speeds at a designated point on a highway in the state. The subjects were unaware that their speed was being recorded. The following one-way ANOVA output was generated from the sample data.

| Groups   | Number of observation | Sum      | Mean   |
|----------|-----------------------|----------|--------|
| Under 21 | 20                    | 1489.729 | 74.486 |
| 21 to 50 | 20                    | 1415.272 | 70.764 |
| Over 50  | 20                    | 1334.178 | 66.709 |

**ANOVA**

| Source of Variation | SS        | df | MS | F | $F_{crit}$ |
|---------------------|-----------|----|----|---|------------|
| Between Groups      | 605.2707  | B  | E  | Z | 3.15       |
| Within Groups       | A         | C  | X  |   |            |
| Total               | 4126.3980 | D  |    |   |            |

i. Based on the information provided, calculate the missing values denoted by A, B, C, D, E, X and Z. (3.5 marks)

ii. State the appropriate hypothesis and test it at the 5% alpha (significance) level. (1.5 marks).  
Note: F-critical is 3.15.

iii. Using Fisher's LSD comparison approach, conduct a pairwise comparison test to determine if there exist significant differences in the pairs of under-21 and 21 to 50 groups at a significance level of alpha 5%. (4 marks). Note: The t-critical is 2.002.

**Question 2**

The government of Ghana has available GH¢1 billion earmarked for financing the Free SHS next year. Instead of letting this money sit in a bank account for a paltry 6% risk free interest rate, it has decided to invest half of the money in four stocks on the Ghana Stock Exchange (GSE). The four stock options the government is considering and the relevant financial data are as follows:

|                                  | Stock |    |    |    |
|----------------------------------|-------|----|----|----|
|                                  | A     | B  | C  | D  |
| Price Per Share (in GH¢)         | 100   | 50 | 80 | 40 |
| Annual Return (in GH¢)           | 18    | 6  | 8  | 8  |
| Possible Loss Per Share (in GH¢) | 10    | 6  | 6  | 5  |

However, the annual return is only a forecast (provided by experts at the ministry of finance), and could be worse or better – a risk that the government has been advised to be worry of in order not to jeopardize the finances of the Free SHS program. For example, though a share of stock A could yield a return amount of GH¢18, it is also likely it could lead to a loss of GH¢10.

In order to minimize the risk (i.e. losses) associated with investing on the GSE, the Finance Ministry has advised the government to adhere to the following guidelines:

- (1) The total forecasted annual return for the four stocks must be at least 9% of the total amount invested to justify the investment. Also, total possible losses must not exceed 8% of the total amount invested.
  - (2) The amount invested in stock A and Stock C must not exceed GH¢200 million since when one performs better (worse) the other also performs better (worse). Likewise, the amount invested in Stock B and D must not exceed GH¢350 million for the same reason as that of Stock A and C.
  - (3) Although Stock A carries a risk of a loss of GH¢10, the government is willing to buy at least 500,000 shares given the high return of GH¢18 per share.
- a. Formulate a linear program to determine the number of shares of each stock the government should buy in order to minimize the risk involved. Note that the government is not obliged to spend all the money intended for investment. (10 marks)

The table below gives a partial report of the sensitivity analysis for the problem in (a) after it was solved using Excel Solver. Use this report to answer the following questions.

**Variable**

| Stock             | Final Value | Reduced Cost | Objective Coefficient | Allowable Increase | Allowable Decrease |
|-------------------|-------------|--------------|-----------------------|--------------------|--------------------|
| Shares of Stock A | 2000000     | 0            | 10                    | 1.25               | 1E+30              |
| Shares of Stock B | 0           | 2.25         | 6                     | 1E+30              | 2.25               |
| Shares of Stock C | 0           | 2            | 6                     | 1E+30              | 2                  |
| Shares of Stock D | 1125000     | 0            | 5                     | 3                  | 0.56               |

| Constraint              | Final Value | Shadow Price | Constraint R.H. Side | Allowable Increase | Allowable Decrease |
|-------------------------|-------------|--------------|----------------------|--------------------|--------------------|
| Annual Return           | 45000000    | 0.625        | 45000000             | 51000000           | 9000000            |
| Amount in Stock A and C | 20000000    | -0.0125      | 20000000             | 5000000            | 15000000           |
| Shares of Stock A       | 2000000     | 0            | 500000               | 1500000            | 1E+30              |

- b. How many shares of each stock should be bought given the objective and the constraints, and what is the total possible loss that could occur? (5 marks)
- c. Will the allocation change if the objective coefficient value for Stock B is decreased by GH¢3? Explain. (3 marks)
- d. What will happen to the possible total loss if the total annual return requirement were to be raised by GH¢10,000,000? (4 marks)
- e. Interpret the reduce cost of GH¢2 for Stock C. (3 marks)

**Question 3**

The table below has data on a sample of production volumes ( $x$ ), of a manufacturing operation, the associated total cost ( $y$ ), and the related deviations from the mean.

| Production Volume (Units) | Total Cost (GHS) | $(x_i - \bar{x})$ | $(y_i - \bar{y})$ |
|---------------------------|------------------|-------------------|-------------------|
| 278                       | 4014             | -125              | -1380             |
| 340                       | 4200             | -63               | -1194             |
| 400                       | 5200             | -3                | -194              |
| 430                       | 5250             | 27                | -144              |
| 450                       | 6700             | 47                | 1306              |
| 520                       | 7000             | 117               | 1606              |

A partial report of a regression analysis, with total cost as the dependent variable, and production volumes as the independent variable is shown in the table below.

**SUMMARY OUTPUT**

| Regression Statistics |        |
|-----------------------|--------|
| Multiple R            | 0.94   |
| R-Square              |        |
| Adjusted R Square     | 0.85   |
| Standard Error        | 486.24 |
| Observations          | 6      |

**ANOVA**

|            | df | SS      | MS      | F        | Sig. F |
|------------|----|---------|---------|----------|--------|
| Regression |    |         | 6727565 | 28.45495 | 0.006  |
| Residual   |    |         |         |          |        |
| Total      |    | 7673280 |         |          |        |

|                          | Coefficients | Standard Error | t Stat | P-value | Lower 95% |
|--------------------------|--------------|----------------|--------|---------|-----------|
| Intercept                | -97.612      | 1048.45        | -0.093 | 0.93    | -3008.58  |
| Production Volume(units) | 13.63        | 2.55           |        | 0.006   | 6.53      |

- a. Derive the estimated regression equation (by hand) that could be used to predict the total cost for a given production volume. Show all the necessary steps. (10 marks)

- b. What is variable cost per unit produced? (2 marks)
- c. What percentage of the variation in total cost can be explained by production volume? (4 marks)
- d. Test to determine if there exist a significant linear relationship between production volume and total cost, using a significance level of 0.05. (5 marks)
- e. The company's production schedule show 500 units must be produced next month. What is the estimated total cost for this operation? (4 marks)

### Formula Sheet

$$P(x) = \frac{n!}{x!(n-x)!} P^x (1-p)^{n-x}$$

$$P(x) = \frac{\mu^x e^{-\mu}}{x!}$$

$$P(x) = \frac{C_{n-x}^{N-x} C_x^X}{C_n^N}$$

#### Normal and sampling distribution

$$Z = \frac{X-\mu}{\sigma}$$

$$P(a \leq z \leq b) = P(z \leq b) - P(z \leq a)$$

$$Z = \frac{\bar{x}-\mu}{\frac{\sigma}{\sqrt{n}}}$$

$$CI = \bar{x} \pm t_{\alpha/2} * s/\sqrt{n}$$

When  $\sigma_1$  and  $\sigma_2$  are known

$$\sigma_{\bar{x}_1 - \bar{x}_2} = \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$$

$$\bar{x}_1 - \bar{x}_2 \pm z_{\alpha/2} \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$$

$$Z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

When  $\sigma_1$  and  $\sigma_2$  are unknown

$$(\bar{x}_1 - \bar{x}_2) \pm t_{\alpha/2} \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}} ; t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

When  $\sigma_1$  and  $\sigma_2$  are unknown but the two variances are assumed equal (i.e.  $\sigma_1 = \sigma_2 = \sigma$ )

$$s_p^2 = \frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}; \quad t = \frac{\bar{x}_1 - \bar{x}_2}{s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

#### One-Way-Anova

$$SST = \sum_{i=1}^k \sum_{j=1}^{n_i} (x_{ij} - \bar{x})^2 ; \quad SSB = \sum_{i=1}^k n_i (\bar{x}_i - \bar{x})^2 ; \quad SSW = \sum_{i=1}^k \sum_{j=1}^{n_i} (x_{ij} - \bar{x}_i)^2$$

$$F = \frac{MSB}{MSW} ;$$

$$\text{Fisher's LSD critical range} = t_{\alpha/2} \sqrt{MSE \left( \frac{1}{n_i} + \frac{1}{n_j} \right)}$$

#### Simple Linear Regression

$$b_1 = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sum_{i=1}^n (x_i - \bar{x})^2} ;$$

$$b_0 = \bar{y} - b_1 \bar{x}$$

$$s_{b_1} = \frac{s_\varepsilon}{\sum_{i=1}^n (x_i - \bar{x})^2}$$

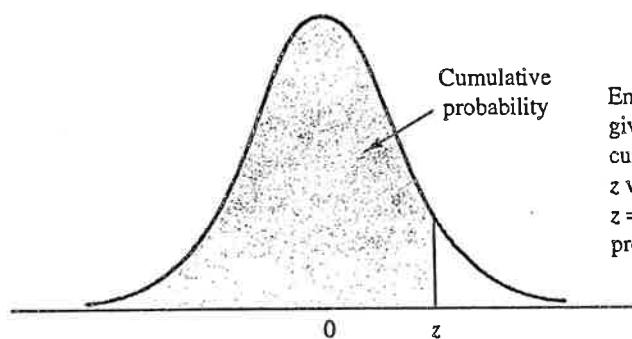
$$s_\varepsilon = \sqrt{\frac{SSE}{n-2}}$$

$$\hat{y} = b_0 + b_1 x$$

$$s_\varepsilon = \sqrt{\frac{SSE}{n-k-1}} ; \quad CI_{b_1} = b_1 + t_{\alpha/2} s_{b_1} ; \quad CI_{b_0} = b_0 + t_{\alpha/2} s_{b_0} ; \quad t = \frac{r}{\sqrt{\frac{1-r^2}{n-2}}} ;$$

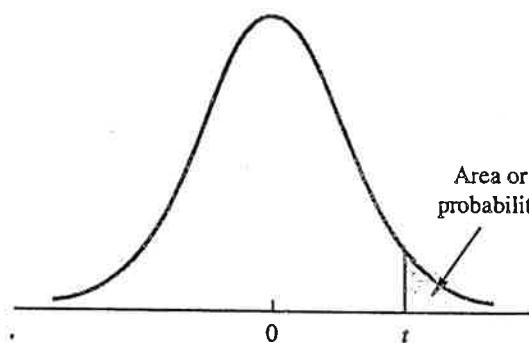
$$r = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \sum_{i=1}^n (y_i - \bar{y})^2}}$$

TABLE 1 CUMULATIVE PROBABILITIES FOR THE STANDARD NORMAL DISTRIBUTION (Continued)



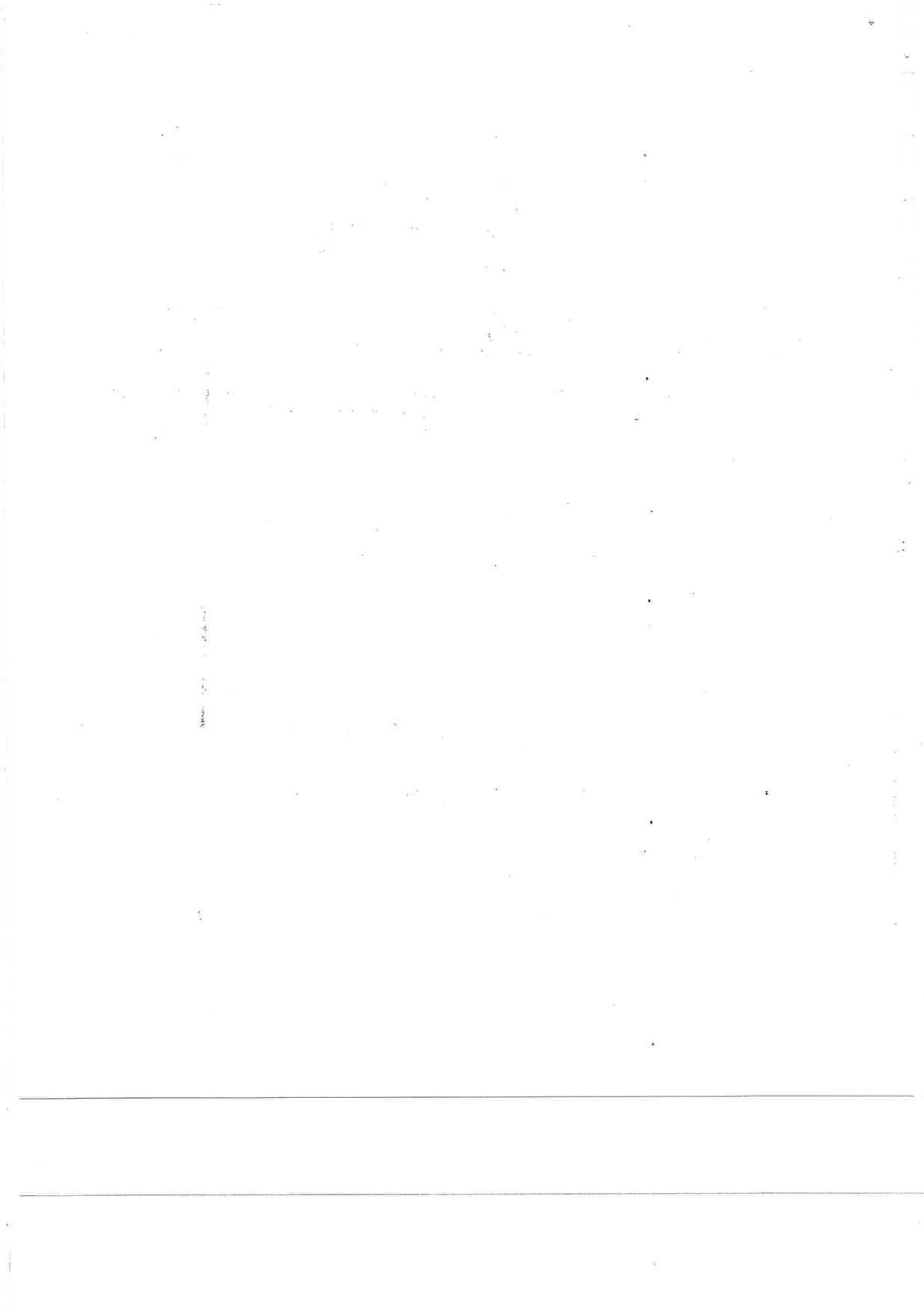
Entries in the table give the area under the curve to the left of the  $z$  value. For example, for  $z = 1.25$ , the cumulative probability is .8944.

| $z$ | .00   | .01   | .02   | .03   | .04   | .05   | .06   | .07   | .08   | .09   |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| .0  | .5000 | .5040 | .5080 | .5120 | .5160 | .5199 | .5239 | .5279 | .5319 | .5359 |
| .1  | .5398 | .5438 | .5478 | .5517 | .5557 | .5596 | .5636 | .5675 | .5714 | .5753 |
| .2  | .5793 | .5832 | .5871 | .5910 | .5948 | .5987 | .6026 | .6064 | .6103 | .6141 |
| .3  | .6179 | .6217 | .6255 | .6293 | .6331 | .6368 | .6406 | .6443 | .6480 | .6517 |
| .4  | .6554 | .6591 | .6628 | .6664 | .6700 | .6736 | .6772 | .6808 | .6844 | .6879 |
| .5  | .6915 | .6950 | .6985 | .7019 | .7054 | .7088 | .7123 | .7157 | .7190 | .7224 |
| .6  | .7257 | .7291 | .7324 | .7357 | .7389 | .7422 | .7454 | .7486 | .7517 | .7549 |
| .7  | .7580 | .7611 | .7642 | .7673 | .7704 | .7734 | .7764 | .7794 | .7823 | .7852 |
| .8  | .7881 | .7910 | .7939 | .7967 | .7995 | .8023 | .8051 | .8078 | .8106 | .8133 |
| .9  | .8159 | .8186 | .8212 | .8238 | .8264 | .8289 | .8315 | .8340 | .8365 | .8389 |
| 1.0 | .8413 | .8438 | .8461 | .8485 | .8508 | .8531 | .8554 | .8577 | .8599 | .8621 |
| 1.1 | .8643 | .8665 | .8686 | .8708 | .8729 | .8749 | .8770 | .8790 | .8810 | .8830 |
| 1.2 | .8849 | .8869 | .8888 | .8907 | .8925 | .8944 | .8962 | .8980 | .8997 | .9015 |
| 1.3 | .9032 | .9049 | .9066 | .9082 | .9099 | .9115 | .9131 | .9147 | .9162 | .9177 |
| 1.4 | .9192 | .9207 | .9222 | .9236 | .9251 | .9265 | .9279 | .9292 | .9306 | .9319 |
| 1.5 | .9332 | .9345 | .9357 | .9370 | .9382 | .9394 | .9406 | .9418 | .9429 | .9441 |
| 1.6 | .9452 | .9463 | .9474 | .9484 | .9495 | .9505 | .9515 | .9525 | .9535 | .9545 |
| 1.7 | .9554 | .9564 | .9573 | .9582 | .9591 | .9599 | .9608 | .9616 | .9625 | .9633 |
| 1.8 | .9641 | .9649 | .9656 | .9664 | .9671 | .9678 | .9686 | .9693 | .9699 | .9706 |
| 1.9 | .9713 | .9719 | .9726 | .9732 | .9738 | .9744 | .9750 | .9756 | .9761 | .9767 |
| 2.0 | .9772 | .9778 | .9783 | .9788 | .9793 | .9798 | .9803 | .9808 | .9812 | .9817 |
| 2.1 | .9821 | .9826 | .9830 | .9834 | .9838 | .9842 | .9846 | .9850 | .9854 | .9857 |
| 2.2 | .9861 | .9864 | .9868 | .9871 | .9875 | .9878 | .9881 | .9884 | .9887 | .9890 |
| 2.3 | .9893 | .9896 | .9898 | .9901 | .9904 | .9906 | .9909 | .9911 | .9913 | .9916 |
| 2.4 | .9918 | .9920 | .9922 | .9925 | .9927 | .9929 | .9931 | .9932 | .9934 | .9936 |
| 2.5 | .9938 | .9940 | .9941 | .9943 | .9945 | .9946 | .9948 | .9949 | .9951 | .9952 |
| 2.6 | .9953 | .9955 | .9956 | .9957 | .9959 | .9960 | .9961 | .9962 | .9963 | .9964 |
| 2.7 | .9965 | .9966 | .9967 | .9968 | .9969 | .9970 | .9971 | .9972 | .9973 | .9974 |
| 2.8 | .9974 | .9975 | .9976 | .9977 | .9977 | .9978 | .9979 | .9979 | .9980 | .9981 |
| 2.9 | .9981 | .9982 | .9982 | .9983 | .9984 | .9984 | .9985 | .9985 | .9986 | .9986 |
| 3.0 | .9987 | .9987 | .9987 | .9988 | .9988 | .9989 | .9989 | .9989 | .9990 | .9990 |

TABLE 2 *t* DISTRIBUTION

Entries in the table give *t* values for an area or probability in the upper tail of the *t* distribution. For example, with 10 degrees of freedom and a .05 area in the upper tail,  $t_{.05} = 1.812$ .

| Degrees<br>of Freedom | Area in Upper Tail |       |       |        |        |        |
|-----------------------|--------------------|-------|-------|--------|--------|--------|
|                       | .20                | .10   | .05   | .025   | .01    | .005   |
| 1                     | 1.376              | 3.078 | 6.314 | 12.706 | 31.821 | 63.656 |
| 2                     | 1.061              | 1.886 | 2.920 | 4.303  | 6.965  | 9.925  |
| 3                     | .978               | 1.638 | 2.353 | 3.182  | 4.541  | 5.841  |
| 4                     | .941               | 1.533 | 2.132 | 2.776  | 3.747  | 4.604  |
| 5                     | .920               | 1.476 | 2.015 | 2.571  | 3.365  | 4.032  |
| 6                     | .906               | 1.440 | 1.943 | 2.447  | 3.143  | 3.707  |
| 7                     | .896               | 1.415 | 1.895 | 2.365  | 2.998  | 3.499  |
| 8                     | .889               | 1.397 | 1.860 | 2.306  | 2.896  | 3.355  |
| 9                     | .883               | 1.383 | 1.833 | 2.262  | 2.821  | 3.250  |
| 10                    | .879               | 1.372 | 1.812 | 2.228  | 2.764  | 3.169  |
| 11                    | .876               | 1.363 | 1.796 | 2.201  | 2.718  | 3.106  |
| 12                    | .873               | 1.356 | 1.782 | 2.179  | 2.681  | 3.055  |
| 13                    | .870               | 1.350 | 1.771 | 2.160  | 2.650  | 3.012  |
| 14                    | .868               | 1.345 | 1.761 | 2.145  | 2.624  | 2.977  |
| 15                    | .866               | 1.341 | 1.753 | 2.131  | 2.602  | 2.947  |
| 16                    | .865               | 1.337 | 1.746 | 2.120  | 2.583  | 2.921  |
| 17                    | .863               | 1.333 | 1.740 | 2.110  | 2.567  | 2.898  |
| 18                    | .862               | 1.330 | 1.734 | 2.101  | 2.552  | 2.878  |
| 19                    | .861               | 1.328 | 1.729 | 2.093  | 2.539  | 2.861  |
| 20                    | .860               | 1.325 | 1.725 | 2.086  | 2.528  | 2.845  |
| 21                    | .859               | 1.323 | 1.721 | 2.080  | 2.518  | 2.831  |
| 22                    | .858               | 1.321 | 1.717 | 2.074  | 2.508  | 2.819  |
| 23                    | .858               | 1.319 | 1.714 | 2.069  | 2.500  | 2.807  |
| 24                    | .857               | 1.318 | 1.711 | 2.064  | 2.492  | 2.797  |
| 25                    | .856               | 1.316 | 1.708 | 2.060  | 2.485  | 2.787  |
| 26                    | .856               | 1.315 | 1.706 | 2.056  | 2.479  | 2.779  |
| 27                    | .855               | 1.314 | 1.703 | 2.052  | 2.473  | 2.771  |
| 28                    | .855               | 1.313 | 1.701 | 2.048  | 2.467  | 2.763  |
| 29                    | .854               | 1.311 | 1.699 | 2.045  | 2.462  | 2.756  |
| 30                    | .854               | 1.310 | 1.697 | 2.042  | 2.457  | 2.750  |
| 31                    | .853               | 1.309 | 1.696 | 2.040  | 2.453  | 2.744  |
| 32                    | .853               | 1.309 | 1.694 | 2.037  | 2.449  | 2.738  |
| 33                    | .853               | 1.308 | 1.692 | 2.035  | 2.445  | 2.733  |
| 34                    | .852               | 1.307 | 1.691 | 2.032  | 2.441  | 2.728  |





UNIVERSITY OF GHANA

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FIRST SEMESTER BSc. ADMINISTRATION EXAMINATIONS: 2017/2018

UGBS 301: QUANTITATIVE METHODS (3 credits)

TIME ALLOWED: THREE (3) HOURS

**INSTRUCTIONS:** Answer ALL questions from both section A and section B. All questions must be answered on the question sheet. Carefully plan your answers to fit the spaces provided. Relevant formulae and tables are provided. No credit will be given for an answer with no work shown.

**Section A (25 marks):** This section contains 10 multiple choice questions. Show your work in the space provided and circle the correct answer. Each question carries 2.5 marks.

1. Let  $A^T = \begin{bmatrix} 1 & 3 \\ 2 & 5 \end{bmatrix}$  and  $B = \begin{bmatrix} 0 & 4 \\ -1 & 6 \end{bmatrix}$ ; find  $4AB$

a.  $\begin{bmatrix} -8 & 80 \\ 7 & 16 \end{bmatrix}$     b.  $\begin{bmatrix} 4 & 16 \\ 1 & 80 \end{bmatrix}$     c.  $\begin{bmatrix} -8 & 80 \\ -20 & 168 \end{bmatrix}$     d.  $\begin{bmatrix} 4 & 16 \\ 7 & 26 \end{bmatrix}$     e.  $\begin{bmatrix} 3 & 28 \\ 7 & 168 \end{bmatrix}$

2. Using the elementary row operation technique, determine which of the following matrix equations represents the solution to the system:

$$\begin{aligned} 2x_1 + x_2 &= 2 \\ 5x_1 + 3x_2 &= 13 \end{aligned}$$

a.  $\begin{bmatrix} -8 \\ 7 \end{bmatrix}$     b.  $\begin{bmatrix} 15 \\ 7 \end{bmatrix}$     c.  $\begin{bmatrix} -7 \\ 16 \end{bmatrix}$     d.  $\begin{bmatrix} 4 \\ 7 \end{bmatrix}$     e.  $\begin{bmatrix} 3 \\ 7 \end{bmatrix}$

3. Given the Linear Program

$$\text{Maximize } P = x_1 + 2x_2 + 3x_3$$

$$\text{subject to: } x_1 + 8x_2 + 5x_3 \leq 40$$

$$9x_1 + x_2 + 7x_3 \leq 50$$

$$x_1 \geq 0, x_2 \geq 0, x_3 \geq 0$$

How many slack variables must be introduced to form a linear program of a standard form?

- a. 3.      b. 1.      c. 0.      d. 2      e. 5

4. What is the stopping rule for a minimization in a linear programming problem using the simplex approach?

- a. Each of the reduced cost entry  $\leq 0$
- b. Each of the reduced cost entry  $= 0$
- c. Each of the reduced cost entry  $> 0$
- d. Each of the reduced cost entry  $\geq 0$
- e. Each of the reduced cost entry  $< 0$

5. The amount by which an objective function coefficient would have to improve before it would be possible for the corresponding variable to assume a positive value in the optimal solution is refer to as

- a. Shadow price
- b. Minimum Test Ratio
- c. Reduced Cost
- d. Allowable increase
- e. Feasible solution value

*Use the following information to answer the next two questions.*

Sixty five percent of Ghanaians believe the country is in a recession, even though technically the economy had not shown two straight quarters of negative growth. In a follow up survey, 20 Ghanaians were randomly interviewed.

6. Compute the probability that exactly 4 people believe the country is not in a recession.

- 
- a. 0.878      b. 0.545      c. 0.295      d. 0.102      e. 0.074

- a. 2      b. 10      c. 11      d. 12      e. 13

8. In a survey, 300 people were asked to identify their most used social media platform; 180 stated that their most used social media platform was WhatsApp. If an alpha of 0.05 leads to a  $Z_{0.025} = 1.96$ , the confidence interval for the proportion of people in the population who consider WhatsApp as their major social media platform is

- a.  $CI = (0.544, 0.655)$       b.  $CI = (0.591, 0.601)$       c.  $CI = (0.455, 0.698)$   
d.  $CI = (0.55, 0.621)$       e.  $CI = (0.514, 0.646)$

9. A population has a mean of 400 and a standard deviation of 60. A simple random sample of size 144 is taken to estimate the population mean. What is the standard deviation of the sample mean  $\bar{x}$ ?

- a. 0.42      b. 5      c. 6.66      d. 20      e. 60

10. An ANOVA study involving  $k= 3$  machines with  $n = 5$  observations for each machine produced the following results:  $SSE = 180$ ;  $SSB = 300$ . What is the value of the test statistic?

- a. 1.67      b. 10      c. 15      d. 16      e. 18.2

## SECTION B(4)

## Question 1

Army worm has engulfed large number of farms in the Northern, Upper West, Ashanti, and Brong Ahafo regions of Ghana with the potential to cause serious shortages in grain production next year. The situation has been declared a national disaster by the National Disaster Management Organization (NADMO). To eradicate the spread of the army worm would require a special expensive pesticide of which NADMO could only source 1000 gallons from the international market. Since this amount would not be sufficient to meet the requirement of all four regions, NADMO is planning a rationing based on the benefits each region provides and the resources needed, bearing in mind the political sensitiveness of the situation.

The table below gives a breakdown of the savings that will accrue to the nation, packaging and transportation cost, as well as the number of specialist needed for every gallon of the pesticides sent to each region.

|                              | Per Gallon |            |          |             |
|------------------------------|------------|------------|----------|-------------|
|                              | Northern   | Upper West | Ashanti  | Brong Ahafo |
| Savings                      | GH¢ 8000   | GH¢ 5000   | GH¢ 3000 | GH¢ 6000    |
| Packaging and Transport Cost | GH¢ 120    | GH¢ 140    | GH¢ 100  | GH¢ 120     |
| Number of Specialist         | 2          | 4          | 3        | 4           |

NADMO currently has available only GH¢100,000 allocated for packaging and transportation, and 3200 trained specialists on hand to help with spraying. Two political constraints must also be adhered to. *Political constraint 1* calls for the combined number of gallons of pesticides sent to the Northern and Upper West regions to be at most, twice as many as those sent to the Ashanti and Brong Ahafo regions combined. *Political constraint 2* calls for the ratio of the number of gallons sent to the Northern region to that sent to the Upper West region to not exceed 0.8.

- a. Provide a linear programming formulation to determine the optimal number of gallons of pesticides to send to each region to maximize savings to the nation. (10 marks)

The sensitivity report of the above LP problem solved using Excel Solver is as shown below.

**Variable Cells**

| Name        | Final Value | Reduced Cost | Objective Coefficient | Allowable Increase | Allowable Decrease |
|-------------|-------------|--------------|-----------------------|--------------------|--------------------|
| Northern    | 165         | 0            | 8000                  | 500                | 3750               |
| Upper West  | 206         | 0            | 5000                  | 400                | 3000               |
| Ashanti     | 0           | -1941        | 3000                  | 1941               | 1E+30              |
| Brong Ahafo | 512         | 0            | 6000                  | 2143               | 204                |

**Constraints**

| Name                   | Final Value | Shadow Price | Constraint R.H. Side | Allowable Increase | Allowable Decrease |
|------------------------|-------------|--------------|----------------------|--------------------|--------------------|
| Pesticides Available   | 883         | 0            | 1000                 | 1E+30              | 118                |
| Transport Cost         | 110000      | 44           | 110000               | 9652               | 14000              |
| Number of Specialists  | 3200        | 177          | 3200                 | 467                | 258                |
| Political constraint 1 | -653        | 0            | 0                    | 1E+30              | 653                |
| Northern vs Upper West | 0           | 2353         | 0                    | 233                | 317                |

b. What is the amount that is recommended to be sent to the respective regions and what is the total savings expected from following such plan? (3 marks)

c. Will the suggested allocation change if the per gallon savings from Upper West region were to increase by GH¢ 600? Explain. (3 marks)

d.

i. From the model, there are some pesticides left, yet no pesticide is to be sent to the Ashanti region. In your view, what do you think is necessitating this? (3 marks)

ii. NADMO officials know that it will be a political suicide not to send any pesticide to the Ashanti region although doing so will hurt the overall savings. Suppose they decide to send the pesticides left to the Ashanti region, what impact will this have on the total savings? (3 marks)

e. How will you interpret the shadow price of transportation cost of GH¢ 44? (3 marks)

## Question 2

a. You are the financial manager in charge of fertilizer acquisition at the Ministry of Agriculture. The ministry is evaluating two fertilizer types: Monacide and Fullacide as their main fertilizer for the next 2 years for the planting of maize. The two fertilizers are roughly of the same prize and the decision is to choose the one that provides the largest yield of maize per acre. If however, there isn't any significant difference in yield between them, the ministry will award each manufacturer half the contract.

The field officers selected 10 maize farms across the 10 regions in Ghana and applied the same amount of each fertilizer to 5 acres of land on each farm. The yields from this exercise are as shown in the table below, where for instance, F1 stands for farm 1.

Bags of maize

| Fertilizer | F1  | F2  | F3  | F4  | F5  | F6  | F7  | F8  | F9  | F10 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Monacide   | 300 | 360 | 248 | 420 | 401 | 220 | 284 | 368 | 413 | 325 |
| Fullacide  | 280 | 364 | 255 | 360 | 372 | 216 | 292 | 312 | 388 | 330 |

- i. Formulate the null and alternative hypotheses to test for difference between the population mean yield for Monacide and the population mean yield for Fullacide. (3 marks)
- ii. Suppose the variance of the difference between the yields from each farm is 653.55. Use a 0.05 level of significance to test for difference between the two fertilizers. (7 marks)
- iii. Which is the best decision to take regarding the award of the contract? Explain. (2 marks)

- b. A study was conducted to determine whether the mean spending for recreational activities during the month of August differs for residents of three cities. Random samples of 30 people were selected from each city and their spending on recreation was recorded during August. The following output was generated using Excel:

**ANOVA: Single Factor**

**SUMMARY**

| Groups | Count | Sum   | Average | Variance |
|--------|-------|-------|---------|----------|
| City 1 | 30    | 7897  | 263.2   | 3334.1   |
| City 2 | 30    | 10322 | 344.1   | 2201.8   |
| City 3 | 30    | 6045  | 201.5   | 2215.9   |

Note:  $\bar{x}_1 = 263.2$ ,  $\bar{x}_2 = 344.1$ ,  $\bar{x}_3 = 201.5$ , and the grand mean  $\bar{\bar{x}} = 269.6$

**ANOVA**

| Source of Variation | SS       | df | MS | F |
|---------------------|----------|----|----|---|
| Between Groups      |          |    |    | - |
| Within Groups       |          |    |    | - |
| Total               | 531505.4 |    | -  | - |

- i. Fill in the missing spaces in the ANOVA table above. Show your workings below. (4 marks)

- ii. Using a significance level of 0.05, what conclusions should be made about the three groups?  
(4 marks)

iii. Based on the Fisher's LSD test at 5 percent significance level, what conclusions can be made about the groups? (5 marks)

**Question 3**  
a. A study was done in the city of Accra in which the daily temperature (in °F) and the number of traffic accidents within the city were recorded. These sample data are shown as follows:

| High Temperature<br>(x) | Traffic Accidents<br>(y) | $(x-\bar{x})(y-\bar{y})$ | $(x-\bar{x})^2$ | $(y-\bar{y})^2$ |
|-------------------------|--------------------------|--------------------------|-----------------|-----------------|
| 91                      | 7                        | 6.53                     | 522.45          | 0.082           |
| 56                      | 4                        | 32.96                    | 147.45          | 7.37            |
| 75                      | 9                        | 15.67                    | 47.02           | 5.22            |
| 68                      | 11                       | -0.61                    | 0.02            | 18.37           |
| 50                      | 3                        | 67.39                    | 329.16          | 13.80           |
| 39                      | 5                        | 49.96                    | 849.31          | 2.94            |
| 98                      | 8                        | 38.39                    | 891.45          | 1.65            |

Given this data, use it to answer the following questions;

i. Calculate the sample correlation coefficient between temperature and traffic accidents in Accra. (6 marks)

ii. Provide the interpretation to the calculated correlation coefficient in (i) above. (1 marks)

Examiner: Dr. A. Afful-Dadzie and Dr. A. K.

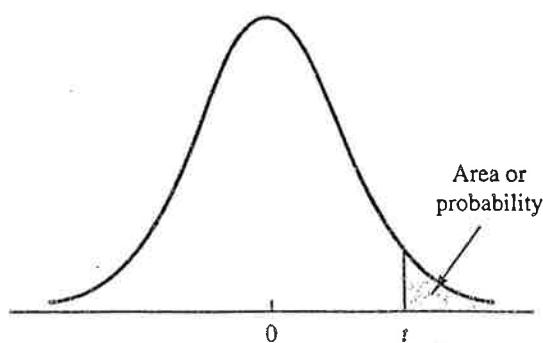
- iii. Perform a test to determine whether there is evidence of a linear relationship between traffic accidents and daily temperature. Use a significance level of 0.05 for the hypothesis test. (5 marks)

- b. The following regression output is available. Notice that some of the values are missing.

| Regression Statistics |              |                |    |
|-----------------------|--------------|----------------|----|
| Multiple R            | 0.75         | -              | -  |
| Adjusted R-Square     | 0.51         | -              | -  |
| Standard Error        |              | -              | -  |
| ANOVA                 |              |                |    |
|                       | df           | SS             | MS |
| Regression            |              |                |    |
| Residual              | 7            | 27.4           |    |
| Total                 | 8            | 63.6           | -  |
|                       | Coefficients | Standard Error | -  |
| Intercept             | 4.8          | 2.2            | -  |
| X                     | 0.054        | 0.018          | -  |

- i. Fill in the blank spaces in the regression output above. Show your workings. (5 marks)

- ii. Provide the 95% confidence interval for the intercept and also for the slope coefficient at 5 percent significance level. (4 marks)
- iii. Test whether the slope coefficient is significantly different from zero at the 5 percent significance level. (2 marks)
- iv. Provide an interpretation to the slope coefficient. (2 marks)

TABLE 2  $t$  DISTRIBUTION

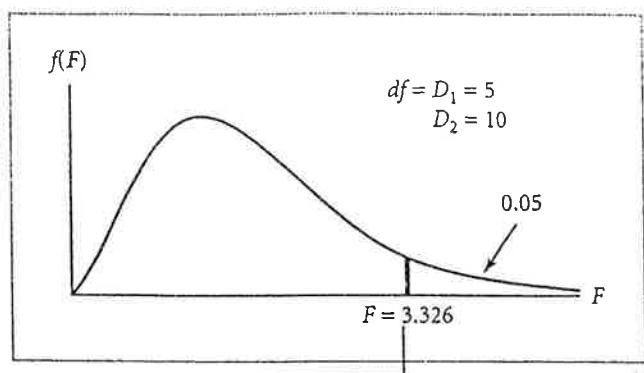
Entries in the table give  $t$  values for an area or probability in the upper tail of the  $t$  distribution. For example, with 10 degrees of freedom and a .05 area in the upper tail,  $t_{.05} = 1.812$ .

| Degrees of Freedom | Area in Upper Tail |       |       |        |        |        |
|--------------------|--------------------|-------|-------|--------|--------|--------|
|                    | .20                | .10   | .05   | .025   | .01    | .005   |
| 1                  | 1.376              | 3.078 | 6.314 | 12.706 | 31.821 | 63.656 |
| 2                  | 1.061              | 1.886 | 2.920 | 4.303  | 6.965  | 9.925  |
| 3                  | .978               | 1.638 | 2.353 | 3.182  | 4.541  | 5.841  |
| 4                  | .941               | 1.533 | 2.132 | 2.776  | 3.747  | 4.604  |
| 5                  | .920               | 1.476 | 2.015 | 2.571  | 3.365  | 4.032  |
| 6                  | .906               | 1.440 | 1.943 | 2.447  | 3.143  | 3.707  |
| 7                  | .896               | 1.415 | 1.895 | 2.365  | 2.998  | 3.499  |
| 8                  | .889               | 1.397 | 1.860 | 2.306  | 2.896  | 3.355  |
| 9                  | .883               | 1.383 | 1.833 | 2.262  | 2.821  | 3.250  |
| 10                 | .879               | 1.372 | 1.812 | 2.228  | 2.764  | 3.169  |
| 11                 | .876               | 1.363 | 1.796 | 2.201  | 2.718  | 3.106  |
| 12                 | .873               | 1.356 | 1.782 | 2.179  | 2.681  | 3.055  |
| 13                 | .870               | 1.350 | 1.771 | 2.160  | 2.650  | 3.012  |
| 14                 | .868               | 1.345 | 1.761 | 2.145  | 2.624  | 2.977  |
| 15                 | .866               | 1.341 | 1.753 | 2.131  | 2.602  | 2.947  |
| 16                 | .865               | 1.337 | 1.746 | 2.120  | 2.583  | 2.921  |
| 17                 | .863               | 1.333 | 1.740 | 2.110  | 2.567  | 2.898  |
| 18                 | .862               | 1.330 | 1.734 | 2.101  | 2.552  | 2.878  |
| 19                 | .861               | 1.328 | 1.729 | 2.093  | 2.539  | 2.861  |
| 20                 | .860               | 1.325 | 1.725 | 2.086  | 2.528  | 2.845  |
| 21                 | .859               | 1.323 | 1.721 | 2.080  | 2.518  | 2.831  |
| 22                 | .858               | 1.321 | 1.717 | 2.074  | 2.508  | 2.819  |
| 23                 | .858               | 1.319 | 1.714 | 2.069  | 2.500  | 2.807  |
| 24                 | .857               | 1.318 | 1.711 | 2.064  | 2.492  | 2.797  |
| 25                 | .856               | 1.316 | 1.708 | 2.060  | 2.485  | 2.787  |
| 26                 | .856               | 1.315 | 1.706 | 2.056  | 2.479  | 2.779  |
| 27                 | .855               | 1.314 | 1.703 | 2.052  | 2.473  | 2.771  |
| 28                 | .855               | 1.313 | 1.701 | 2.048  | 2.467  | 2.763  |
| 29                 | .854               | 1.311 | 1.699 | 2.045  | 2.462  | 2.756  |
| 30                 | .854               | 1.310 | 1.697 | 2.042  | 2.457  | 2.750  |
| 31                 | .853               | 1.309 | 1.696 | 2.040  | 2.453  | 2.744  |
| 32                 | .853               | 1.309 | 1.694 | 2.037  | 2.449  | 2.738  |
| 33                 | .853               | 1.308 | 1.692 | 2.035  | 2.445  | 2.733  |
| 34                 | .852               | 1.307 | 1.691 | 2.032  | 2.441  | 2.728  |

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**APPENDIX H**

**F-Distribution**  
**Table: Upper 5%**  
**Probability (or 5%**  
**Area) under**  
**F-Distribution**  
**Curve**



DENOMINATOR

 $df = D_2$ NUMERATOR  $df = D_1$ 

|     | 1       | 2       | 3       | 4       | 5       | 6       | 7       | 8       | 9       | 10      |
|-----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1   | 161.446 | 199.499 | 215.707 | 224.583 | 230.160 | 233.988 | 236.767 | 238.884 | 240.543 | 241.882 |
| 2   | 18.513  | 19.000  | 19.164  | 19.247  | 19.296  | 19.329  | 19.353  | 19.371  | 19.385  | 19.396  |
| 3   | 10.128  | 9.552   | 9.277   | 9.117   | 9.013   | 8.941   | 8.887   | 8.845   | 8.812   | 8.785   |
| 4   | 7.709   | 6.944   | 6.591   | 6.388   | 6.256   | 6.163   | 6.094   | 6.041   | 5.999   | 5.964   |
| 5   | 6.608   | 5.786   | 5.409   | 5.192   | 5.050   | 4.950   | 4.876   | 4.818   | 4.772   | 4.735   |
| 6   | 5.987   | 5.143   | 4.757   | 4.534   | 4.387   | 4.284   | 4.207   | 4.147   | 4.099   | 4.060   |
| 7   | 5.591   | 4.737   | 4.347   | 4.120   | 3.972   | 3.866   | 3.787   | 3.726   | 3.677   | 3.637   |
| 8   | 5.318   | 4.459   | 4.066   | 3.838   | 3.688   | 3.581   | 3.500   | 3.438   | 3.388   | 3.347   |
| 9   | 5.117   | 4.256   | 3.863   | 3.633   | 3.482   | 3.374   | 3.293   | 3.230   | 3.179   | 3.137   |
| 10  | 4.965   | 4.103   | 3.708   | 3.478   | 3.326   | 3.217   | 3.135   | 3.072   | 3.020   | 2.978   |
| 11  | 4.844   | 3.982   | 3.587   | 3.357   | 3.204   | 3.095   | 3.012   | 2.948   | 2.896   | 2.854   |
| 12  | 4.747   | 3.885   | 3.490   | 3.259   | 3.106   | 2.996   | 2.913   | 2.849   | 2.796   | 2.753   |
| 13  | 4.667   | 3.806   | 3.411   | 3.179   | 3.025   | 2.915   | 2.832   | 2.767   | 2.714   | 2.671   |
| 14  | 4.600   | 3.739   | 3.344   | 3.112   | 2.958   | 2.848   | 2.764   | 2.699   | 2.646   | 2.602   |
| 15  | 4.543   | 3.682   | 3.287   | 3.056   | 2.901   | 2.790   | 2.707   | 2.641   | 2.588   | 2.544   |
| 16  | 4.494   | 3.634   | 3.239   | 3.007   | 2.852   | 2.741   | 2.657   | 2.591   | 2.538   | 2.494   |
| 17  | 4.451   | 3.592   | 3.197   | 2.965   | 2.810   | 2.699   | 2.614   | 2.548   | 2.494   | 2.450   |
| 18  | 4.414   | 3.555   | 3.160   | 2.928   | 2.773   | 2.661   | 2.577   | 2.510   | 2.456   | 2.412   |
| 19  | 4.381   | 3.522   | 3.127   | 2.895   | 2.740   | 2.628   | 2.544   | 2.477   | 2.423   | 2.378   |
| 20  | 4.351   | 3.493   | 3.098   | 2.866   | 2.711   | 2.599   | 2.514   | 2.447   | 2.393   | 2.348   |
| 24  | 4.260   | 3.403   | 3.009   | 2.776   | 2.621   | 2.508   | 2.423   | 2.355   | 2.300   | 2.255   |
| 30  | 4.171   | 3.316   | 2.922   | 2.690   | 2.534   | 2.421   | 2.334   | 2.266   | 2.211   | 2.165   |
| 40  | 4.085   | 3.232   | 2.839   | 2.606   | 2.449   | 2.336   | 2.249   | 2.180   | 2.124   | 2.077   |
| 50  | 4.034   | 3.183   | 2.790   | 2.557   | 2.400   | 2.286   | 2.199   | 2.130   | 2.073   | 2.026   |
| 100 | 3.936   | 3.087   | 2.696   | 2.463   | 2.305   | 2.191   | 2.103   | 2.032   | 1.975   | 1.927   |
| 200 | 3.888   | 3.041   | 2.650   | 2.417   | 2.259   | 2.144   | 2.056   | 1.985   | 1.927   | 1.878   |
| 300 | 3.873   | 3.026   | 2.635   | 2.402   | 2.244   | 2.129   | 2.040   | 1.969   | 1.911   | 1.862   |

DENOMINATOR

 $df = D_2$ NUMERATOR  $df = D_1$ 

|    | 11      | 12      | 13      | 14      | 15      | 16      | 17      | 18      | 19      | 20      |
|----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1  | 242.981 | 243.905 | 244.690 | 245.363 | 245.949 | 246.466 | 246.917 | 247.324 | 247.688 | 248.016 |
| 2  | 19.405  | 19.412  | 19.419  | 19.424  | 19.429  | 19.433  | 19.437  | 19.440  | 19.443  | 19.446  |
| 3  | 8.763   | 8.745   | 8.729   | 8.715   | 8.703   | 8.692   | 8.683   | 8.675   | 8.667   | 8.660   |
| 4  | 5.936   | 5.912   | 5.891   | 5.873   | 5.858   | 5.844   | 5.832   | 5.821   | 5.811   | 5.803   |
| 5  | 4.704   | 4.678   | 4.655   | 4.636   | 4.619   | 4.604   | 4.590   | 4.579   | 4.568   | 4.558   |
| 6  | 4.027   | 4.000   | 3.976   | 3.956   | 3.938   | 3.922   | 3.908   | 3.896   | 3.884   | 3.874   |
| 7  | 3.603   | 3.575   | 3.550   | 3.529   | 3.511   | 3.494   | 3.480   | 3.467   | 3.455   | 3.445   |
| 8  | 3.313   | 3.284   | 3.259   | 3.237   | 3.218   | 3.202   | 3.187   | 3.173   | 3.161   | 3.150   |
| 9  | 3.102   | 3.073   | 3.048   | 3.025   | 3.006   | 2.989   | 2.974   | 2.960   | 2.948   | 2.936   |
| 10 | 2.943   | 2.913   | 2.887   | 2.865   | 2.845   | 2.828   | 2.812   | 2.798   | 2.785   | 2.774   |
| 11 | 2.818   | 2.788   | 2.761   | 2.739   | 2.719   | 2.701   | 2.685   | 2.671   | 2.658   | 2.646   |
| 12 | 2.717   | 2.687   | 2.660   | 2.637   | 2.617   | 2.599   | 2.583   | 2.568   | 2.555   | 2.544   |
| 13 | 2.635   | 2.604   | 2.577   | 2.554   | 2.533   | 2.515   | 2.499   | 2.484   | 2.471   | 2.459   |
| 14 | 2.565   | 2.534   | 2.507   | 2.484   | 2.463   | 2.445   | 2.428   | 2.413   | 2.400   | 2.388   |
| 15 | 2.507   | 2.475   | 2.448   | 2.424   | 2.403   | 2.385   | 2.368   | 2.353   | 2.340   | 2.328   |
| 16 | 2.456   | 2.425   | 2.397   | 2.373   | 2.352   | 2.333   | 2.317   | 2.302   | 2.288   | 2.276   |

### Formula Sheet

$$P(x) = \frac{n!}{x!(n-x)!} P^x (1-p)^{n-x}$$

$$P(x) = \frac{\mu^x e^{-\mu}}{x!}$$

$$P(x) = \frac{C_{n-x}^{N-x} C_x^X}{C_n^N}$$

**Normal and sampling distribution**

$$Z = \frac{\bar{x} - \mu}{\sigma}$$

$$P(a \leq z \leq b) = P(z \leq b) - P(z \leq a)$$

$$Z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}}$$

$$CI = \bar{x} \pm t_{\alpha/2} * s / \sqrt{n}$$

When  $\sigma_1$  and  $\sigma_2$  are known

$$\sigma_{\bar{x}_1 - \bar{x}_2} = \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$$

$$\bar{x}_1 - \bar{x}_2 \pm z_{\alpha/2} \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$$

$$Z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2 + \sigma_2^2}{n_1 + n_2}}}$$

When  $\sigma_1$  and  $\sigma_2$  are unknown

$$(\bar{x}_1 - \bar{x}_2) \pm t_{\alpha/2} \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}} ; t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2 + s_2^2}{n_1 + n_2}}}$$

When  $\sigma_1$  and  $\sigma_2$  are unknown but the two variances are assumed equal (i.e.  $\sigma_1 = \sigma_2 = \sigma$ )

$$s_p^2 = \frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}; \quad t = \frac{\bar{x}_1 - \bar{x}_2}{s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

**One-Way-Anova**

$$SST = \sum_{i=1}^k \sum_{j=1}^{n_i} (x_{ij} - \bar{x})^2 ; \quad SSB = \sum_{i=1}^k n_i (\bar{x}_i - \bar{x})^2 ; \quad SSW = \sum_{i=1}^k \sum_{j=1}^{n_i} (x_{ij} - \bar{x}_i)^2$$

$$F = \frac{MSB}{MSW} ;$$

$$\text{Fisher's LSD critical range} = t_{\alpha/2} \sqrt{MSE \left( \frac{1}{n_i} + \frac{1}{n_j} \right)}$$

**Simple Linear Regression**

$$b_1 = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sum_{i=1}^n (x_i - \bar{x})^2} ;$$

$$b_0 = \bar{y} - b_1 \bar{x}$$

$$s_{b_1} = \frac{s_\varepsilon}{\sum_{i=1}^n (x_i - \bar{x})^2}$$

$$s_\varepsilon = \sqrt{\frac{SSE}{n-2}}$$

$$\hat{y} = b_0 + b_1 x$$

$$s_\varepsilon = \sqrt{\frac{SSE}{n-k-1}} ; \quad CI_{b_1} = b_1 + t_{\alpha/2} s_{b_1} ; \quad CI_{b_0} = b_0 + t_{\alpha/2} s_{b_0} ; \quad t = \frac{r}{\sqrt{\frac{1-r^2}{n-2}}} ;$$

$$r = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \cdot \sum_{i=1}^n (y_i - \bar{y})^2}}$$



UNIVERSITY OF GHANA

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FIRST SEMESTER BSC. ADMINISTRATION EXAMINATIONS: 2016/2017

UGBS 301: QUANTITATIVE METHODS (3 credits)

THREE (3) HOURS

**INSTRUCTIONS:** Answer ALL questions from both section A and section B. All questions must be answered on the question sheet. Carefully plan your answers to fit the spaces provided. Relevant formulae and tables are provided. No credit will be given for an answer with no work shown.

**Section A (25 marks):** This section contains 10 multiple choice questions. Show your work in the space provided and circle the correct answer. Each question carries 2.5 marks.

1. What is the optimal solution for the LP problem:

$$\text{Min } 5x_1 + 10x_2$$

s.t

$$7x_1 + 2x_2 \geq 28$$

$$2x_1 + 12x_2 \geq 24$$

$$x_1, x_2 \geq 0$$

- a.  $x_1 = 3.6, x_2 = 1.4$ ,      b.  $x_1 = 0, x_2 = 14$ ,      c.  $x_1 = 12, x_2 = 0$ ,      d.  $x_1 = 0, x_2 = 0$   
e.  $x_1 = 0, x_2 = 2$

2. Which of the following is/are true of linear programming?
- For a maximization problem, an optimal solution to an LP is a point in the feasible region with the largest objective function value.
  - The feasible region for an LP is the set of all points that satisfies all the LP's constraints and sign restrictions.
  - A constraint is binding if the left-hand side and the right-hand side of the constraint are equal when the optimal values of the decision variables are substituted into the constraint.
  - A constraint is nonbinding if the left-hand side and the right-hand side of the constraint are unequal when the optimal values of the decision variables are substituted into the constraint
  - The reduce cost is the increase in objective function value due to a unit increase in the RHS value of a constraint.
- a. i, ii, iii only    b. iii, iv, v only    c. i, ii, iii, iv only    d. i, ii, iii, v only    e. All of the above.

3. Consider the following linear programming problem:

$$\begin{array}{ll} \text{Max} & Z = 14x + 18y \\ \text{Subject to} & 8x + 6y \leq 960 \\ & 4x + 6y \leq 720 \\ & x \geq 0, y \geq 0 \end{array}$$

Which of the following points  $(x, y)$  are feasible?

- i.  $(-70, 60)$     ii.  $(110, -15)$     iii.  $(60, 90)$     iv.  $(60, 80)$     v.  $(30, 100)$

- a. i, ii, iii, iv    b. ii, iii, iv    c. ii, iii, v    d. iv, v    e. iii, iv, v

4. You are mixing  $x$  grams of ingredient A and  $y$  grams of ingredient B. What is the equation or inequality that models the requirement that the mixture should contain at least 25% of ingredient A by weight?

- 
- a.  $4x - y \leq 0$     b.  $x - 4y \geq 0$     c.  $x - y \geq 4$     d.  $3x - y \geq 0$     e.  $4x - y = 0$

5. A ballot box consists of 10 casted votes of which 3 are invalid. If 3 votes are randomly selected from the box, what is the probability that 2 will be invalid?

- a. 0.912      b. 0.175      c. 0.553      d. 0.245      e. 0.825

6. Arrivals to a bank automated teller machine (ATM) are distributed according to a Poisson distribution with a mean equal to 1 per 5 minutes. What is the probability that fewer than two customers will arrive in a 15-minute interval?

- a.  $4e^{-3}$       b.  $\frac{4}{3}e^{-3}$       c.  $3e^{-3}$       d.  $\frac{3}{4}e^{-3}$       e.  $2e^{-3}$

7. Assuming the population of interest is approximately normally distributed, construct a 95% confidence interval estimate for the population mean given the following values:

$$\bar{x} = 20, s = 4, n = 10$$

- 
- a. (17.56, 22.44)      b. (19.18, 20.81)      c. (18.51, 21.51)      d. (14.2, 25.32)  
e. (16.98, 23.02)

8. What is the relevant critical value (in standard normal form) for the following circumstance?

$$H_0: \mu \leq 13; \quad H_a: \mu > 13; \quad n = 20; \quad \sigma = 8, \quad \alpha = 0.02$$

- a. 2.055      b. -1.645      c. 1.645      d. -2.325      e. 1.985

9. A test of hypothesis has the following hypotheses:

$$H_0: p \leq 0.5 \quad \text{and} \quad H_a: p > 0.5$$

Calculate the numerical value of the test statistic for a sample size of 30, and a sample proportion of 0.55.

- a. 1.826      b. 0.548      c. 2.450      d. 0.985      e. 1.96

10. Assume  $n$  is sample size. Which of the following is/are generally true in statistical inference?

- i. If a population is normal with mean  $\mu$  and standard deviation  $\sigma$ , the distribution of the sample means ( $\bar{x}$ ) is also normally distributed with  $\mu_{\bar{x}} = \mu$  and  $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$ .
- ii. Even if the population is not normal, sample means from the population will be approximately normal as long as the sample size is large enough, and the sampling distribution will have  $\mu_{\bar{x}} = \mu$  and  $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$ .
- iii. For most distributions,  $n > 30$  will give a sampling distribution that is nearly normal.
- iv. Normality must be ensured when constructing confidence intervals.

- a. i,ii,iii only      b. i,ii,iv only      c. i, iii only      d. All of the above      e. None of the above

- a. debt capital
- b. equity capital
- c. borrowed capital
- d. intellectual capital

18. One of the primary benefits of sole proprietorship of business is

- a. Unlimited liability
- b. Unlimited life
- c. Capital raising capacity
- d. None of the above

19. Which of the following is a valid criticism concerning the goal of firms to maximize profits?

- a. profit maximization ignores expenses
- b. profit maximization is completely unrelated to shareholder wealth
- c. profit maximization may ignore the timing of those profits
- d. there are no valid criticisms of profit maximizing firms

20. Which of the following parties have the proper incentives to make risky, value increasing investments for the firm?

- a. Suppliers
- b. Creditors
- c. Shareholders
- d. managers who are only compensated with a salary

21. An agent of a firm could be any of the following:

- a. 100% owner of the firm
- b. the IRS agent in charge of auditing the firm's tax return
- c. an employee who does not own any proportion of the firm
- d. a supplier of the firm

22. What of the following is FALSE regarding debt capital?

- a. Debt holders are required to receive interest payments at fixed intervals.
- b. Debt holders receive the amount of their loan (called principal) at the debt's maturity date.
- c. Debt holders can force the firm into bankruptcy if interest payments are not made.
- d. Debt holders have voting rights for the firm's board of directors.

23. Which of the following is FALSE regarding equity capital?

- a. Common stock holders bear most of the firm's business and financial risk.
- b. Preferred stock holders receive a fixed annual payment on their invested capital.
- c. Common stock holders have ownership in the firm by voting for the firm's management.
- d. Preferred stockholders can force the firm into bankruptcy if dividend payments are not paid.

24. Why do shareholders bear most of the risk of running a firm?

- a. They only have a residual claim on the firm's cash flows.
- b. They receive a salary from the company.
- c. They are guaranteed a fixed payout each quarter.
- d. Shares can be taken away at any time without notice.

25. Which of the following actions should a Manager take if he or she wants to decrease the operating cycle?

- a) Decrease the period of time for which credit is granted to customers
- b) Decrease the rate at which the average inventory is sold
- c) Delay payments to suppliers to decrease the cash cycle
- d) Increase the inventory level while maintaining constant sales

26. Which one of the following will decrease the cash cycle?

- a) Increasing the operating cycle
- b) Decreasing the accounts receivable turnover rate
- c) Decreasing the accounts payable period
- d) Increasing the inventory turnover rate

27. Which one of the following credit terms is most apt to produce the shortest accounts receivable period?

- a) Net 10
- b) 2/10, net 30
- c) 2/20, net 45
- d) 3/5, net 10

28. Baker Industries offers credit terms of 2/20; net 60 to Charlie Co. Charlie Co. has an inventory period of 15 days and an operating cycle of 45 days. Given this, which of the following statements are correct?

- I. The credit terms of Baker Industries are too restrictive;
  - II. If Charlie Co. forgoes the discount on its purchases, it will have a negative cash cycle;
  - III. Baker Industries is financing the accounts receivables of Charlie Co;
  - IV. If Charlie Co. is delinquent in its payment, Baker Industries should be concerned)
- a) III and IV only  
b) I and II only  
c) I, III and IV only  
d) II, III and IV only

29. Which of the following is not a metric to use for measuring the length of the cash cycle?

- a) Acid tests days
- b) Accounts receivable days
- c) Accounts payable days
- d) Inventory days

30. What does the following trade credit jargon refer to? "5/7 net 30".

- a) A discount of 5% will be given full payment within 7 days. Failing that, the account must be settled in 30 days.
- b) A discount of 7% will be given for full payment within 5 days. Failing that, the account must be settled in 30 days.
- c) A discount of 30% will be given for full payment within 7 days. Failing that, the account must be settled in 30 days.
- d) A discount of 5% will be given for full payment within 30 days. Failing that, the account must be settled in 7 days.

31. Which of the following best describes the economic order quantity (EOQ) model?

- a) The EOQ model is based on the trade-off between average order cost which increase with order quantity and average storage cost which declines with order quantity.
- b) The EOQ model is based on the trade-off between average order cost which increases with order quantity and average storage cost which increases with order quantity.
- c) The EOQ model is based on the trade-off between average order cost which declines with order quantity and average storage cost which increase with order quantity.
- d) The EOQ model is based on the trade-off between average order cost which declines with order quantity and average storage cost which declines with order quantity.

32. Which of the following is an internal source of investment funding?

- a) Issuing bonds
- b) Sale of stocks
- c) Undistributed profits
- d) All of the above are internal sources

33. The method of raising funds for capital investment that involves the greatest risk to the firm is :

- a) Borrowing by selling bonds
- b) Relying on retained profits
- c) Issuing common stock
- d) Raising the dividend rate

34. Which of the following sources of funds for capital investment involves a tax adjustment to determine the cost of capital?

- a) Retained profits
- b) Issuing debt
- c) Issuing common stock
- d) All of the above involve a tax adjustment

35. Consider the following statements.

- (1) Preference share capital may be secured on the assets of the business

(2) Factoring is a form of asset-based finance.

Are the statements true or false?

- | Statement |       |
|-----------|-------|
| 1         | 2     |
| a. True   | True  |
| b. True   | False |
| c. False  | True  |
| d. False  | False |

36. What is the validity of the following statements?

- (1) A warrant is a form of loan note that can be exchanged for equities, at the shareholders' discretion, at a predetermined price and time.
- (2) An operating lease is virtually the same as a financier providing finance as a loan and that finance being used to buy a particular asset needed by the effective "borrower"

- | Statement |       |
|-----------|-------|
| 1         | 2     |
| A         | True  |
| B         | True  |
| C         | False |
| D         | False |

37. Consider the following two statements:

- (1) Junk bonds normally carry a higher rate of interest than investment-grade bonds.
- (2) Convertible loan notes will normally carry a higher rate of interest than conventional loan notes.

Which of the following combinations concerning the above statements is correct?

Statement

1      2

- A True    True
- B True    False
- C False    True
- D False    False

38. If  $EOQ = 360$  units, order costs are Ghc5 per order, and carrying costs are Ghc.20 per unit, what is the usage in units?
- a) 129,600 unit
  - b) 2,592 units
  - c) 25,920 units
  - d) 18,720 units
39. The credit policy of Spurling Products is "1.5/10, net 35". At present 30% of the customers take the discount, 62% pay within the net period, and the rest pay within 45 days of invoice. What would receivables be if all customers took the cash discount?
- a) Lower than the present level
  - b) No change from the present level
  - c) Higher than the present level
  - d) Unable to determine without more information
40. A negative net cash inflow on a cash budget indicates that a firm:
- a) Has cash outflows other than those related to accounts payable
  - b) Is facing bankruptcy
  - c) Has projected cash disbursements that exceed the projected cash collections
  - d) Has funds available for short-term investing

41. The Winters Co. has annual sales of Ghc 918,700. Cost of goods sold is equal to 55 percent of sales. The firm has an average accounts payable balance of Ghc 72,400. How many days on average does it take the Winters Co. to pay its suppliers?
- 38 days
  - 46 days
  - 52 days
  - 34 days
42. An investor is considering starting a new business. The company would require \$500,000 of assets, and it would be financed entirely with common stock. The investor will go forward only if she thinks the firm can provide a 15.0 percent return on the invested capital, which means that the firm must have an ROE of 15.0 percent. How much net income must be expected to warrant starting the business?
- \$75,000
  - \$3,333
  - \$33,333
  - There is not enough information to answer this question.
43. During the latest year Ruth Corp. had sales of \$300,000 and a net income of \$20,000, and its year-end assets were \$200,000. The firm's total debt to total assets ratio was 40 percent. Based on the Du Pont equation, what was the firm's ROE?
- 15.33%
  - 16.33%
  - 15.67%
  - 16.67%
44. Which one of the following is NOT a function of a corporate financial manager?
- decide how a firm should use its assets
  - locate external funding
  - analyze cash flows
  - manage assets for individuals

45. Which one of the following is the best example of an agency problem? Assume the company is paying the employees' travel expenses.
- Juan, the chief financial officer, travels to France to meet with the bank that is loaning the firm money to build a factory in France. While in France, he tours Paris.
  - Mike, the president, travels to China to attend an international convention related to the company's line of business. While there, he tours the Great Wall of China.
  - Ann, the controller, travels to Orlando, Florida to visit Disney World with friends. While there, she talks with her friends about employment opportunities at the firm.
  - Luisa, the marketing director, travels to California to attend a sales convention. While there she visits Disneyland.
46. Luigi is the sole proprietor of The Village Pizza Shop. He invests a total of \$45,000 in that business. After five years, the business has no money and goes broke. After all of the assets are sold, The Village Pizza Shop still owes \$65,000 to its creditors. How much of this debt is Luigi's personal liability?
- \$20,000
  - \$45,000
  - \$55,000
  - \$65,000
47. Which one of the following best describes the tax situation of a corporation?
- The business profits are reported as personal income and represent taxable income to the owners when the profits are earned.
  - The profits of the corporation are taxed when earned and taxed again when distributed to the company owners.
  - The profits are reported by the corporation and taxed solely as corporate income.

- d. The profits are distributed based on percentage ownership and taxed to the owners individually.
48. The maximum amount a shareholder can lose if a corporation goes bankrupt is
- zero, as the shareholder has limited liability.
  - an amount equal to his/her proportionate share of the corporation's liability.
  - an amount equal to his/her investment.
  - all of his/her personal assets.
49. Martha, Chris and Amanda, have started their own business. Which form of business would be impossible for them to operate within?
- partnership
  - sole proprietorship
  - private corporation
  - limited partnership
50. XYZ Corporation would like to issue shares for the first time. The first issuance of shares will be done through which market?
- primary market
  - secondary market
  - money market
  - GSE

## SECTION B (25 MARKS)

1. Anuonyam is considering paying GH¢ 100 into a fund on a monthly basis for two years starting in one year's time. The interest earned will be 2% per month. Once all these payments have been made, the investment will be transferred immediately to an account that will earn interest at 10% per annum until maturity. The fund matures in five years' time after the last payment is made into it. Calculate the terminal value of the fund in 7 years' time  
(10 marks)
2. Mr. Smart heard about the Ghana Government's 'Smart Borrowing' concept and borrowed GH¢ 15, 000 to have a successful wedding and he wants to pay off the loan in 12 monthly instalments otherwise the bank will come for his wife and children born to them since they were pledged as collateral for the loan. What should the monthly repayments be if the annual interest rate is 18%?  
(5 marks)
3. Assume that a house costs 150,000 and the borrower puts 25% deposit and borrows the difference from GCB Bank payable over 25 years. The mortgage rate is 12% a month.

**Required:**

- a) Determine the monthly mortgage payments (5 Marks)
- b) Prepare an amortization schedule demonstrating the flow of transactions for the first five (5) months of the payment (5 Marks)



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BACHELOR OF SCIENCE/ARTS IN ADMINISTRATION (BSC./B.A)

FIRST SEMESTER EXAMINATIONS: 2018/2019

UNIVERSITY OF GHANA BUSINESS SCHOOL

**OHRM303: HUMAN BEHAVIOUR IN ORGANISATIONS [3 CREDITS]**

**INSTRUCTIONS: ANSWER ALL QUESTIONS IN THE ANSWER BOOKLET**

**TIME ALLOWED: 2 AND A HALF HOURS (2.5 HOURS)**

1) Differences arising from which one of the following factors becomes more important to people as they get to know each other?

- a) gender
- b) ethnicity
- c) sexual orientation
- d) personality

2) Amanda works as a technical support executive at Ghana Pride Systems. Which of the following factors, if true, could trigger certain stereotypes about Amanda among her co-workers, though not necessarily reflecting the way they feel or think about her?

- a) Amanda does not believe in engaging in gossip about her coworkers.
- b) Amanda prefers working late every evening to working over the weekend.
- c) Amanda has a Swedish mother and an African American father.
- d) Amanda tends to dominate discussions among her co-workers.

3) People are going to be different. The focus of managers should be to \_\_\_\_\_.

- a) find ways to keep various groups within the workforce from creating conflict
- b) find ways to develop strong relationships with and engage the entire workforce
- c) make sure the practices within their departments comply with the letter of the laws governing discrimination in employment
- d) find commonalities among various groups displaying surface-level diversity

- 4) Which of the following statements is not true about attitudes in the workplace?
- Changing employee attitudes is necessary if you are to manage dissonance.
  - High pay alone is not likely to create a satisfying workplace.
  - Generating positive job attitudes helps lower absenteeism and turnover.
  - Attitudes help determine how well employees perform on the job.
  - Attitudes give warnings of potential problems
- 5) Why should managers be interested in their employees' attitudes?
- They result from behavior.
  - They cause problems.
  - They give warnings of potential problems.
  - They are generally low.
  - They result in cognitive dissonance.
- 6) Which of the following is one of the relationships proposed in expectancy theory?
- reward-satisfaction relationship
  - satisfaction-performance relationship
  - rewards-personal goals relationship
  - effort-satisfaction relationship
  - performance-achievement relationship
- 7) According to expectancy theory, the degree to which organizational rewards satisfy an individual's personal goals or needs and the attractiveness of those potential rewards for the individual is known as what sort of relationship?
- performance-reward
  - effort-performance
  - rewards-personal goals
  - effort-satisfaction
  - performance-achievement
- 8) Which of the following is a form of recognition?
- personal congratulations
  - job enlargement
  - job sharing
  - flexible benefit packages
  - profit sharing
- 9) What term is used for the tendency for individuals to spend less effort when working collectively?
- groupthink
  - the rule of diminishing returns
  - social loafing
  - groupshift
  - clustering

- 10) Which of the following is a phenomenon in which group pressures for conformity deter the group from critically appraising unusual, minority, or unpopular views?
- group conformity
  - groupshift
  - groupthink
  - compromise
  - risk transfer
- 11) Cross-functional teams rely heavily on \_\_\_\_\_ communication, which can be problematic if their managers are not kept informed about the decisions.
- diagonal
  - upward
  - vertical
  - lateral
- 12) During the communication process, which of the following is most likely to result in lost information?
- information processing
  - information overload
  - information filtering
  - effective communication
  - the maximal effort effect
- 13) The process by which individuals attempt to control the perceptions that others form of them is called \_\_\_\_\_.  
a. impression management  
b. information management  
c. defensive behavior  
d. perception management  
e. reflection control
- 14) The centerpiece of most diversity programs is \_\_\_\_\_.  
a. top management commitment  
b. employee commitment  
c. training  
d. human resource personnel  
e. employee satisfaction
- 15) Diversity training programs are generally intended to provide a vehicle for \_\_\_\_\_.  
a. increasing awareness and examining stereotypes  
b. focusing on individual differences  
c. eliminating group learning  
d. balancing work/life conflicts  
e. socializing otherwise unmanageable employees

- 16) Family issues, economic problems, and personality characteristics are examples of the \_\_\_\_\_ factor of potential stress.
- social
  - environmental
  - personnel
  - psychological
  - personal
- 17) \_\_\_\_\_ is an example of an individual approach to stress reduction.
- Selection and placement
  - Redesigning jobs
  - Goal setting
  - Relaxation techniques
  - all of the above
- 18) The first group meeting is in progress. The five attendees are exchanging contact information and getting acquainted. This group is in the \_\_\_\_\_ stage.
- forming
  - norming
  - storming
  - performing
- 19) Ben is selecting members for a problem-solving team. Which of the following team compositions is most likely to result in better team performance?
- employees with at least ten years of seniority
  - employees from the quality department
  - employees from a variety of ethnic and gender backgrounds
  - an all-male or all-female team
- 20) Organizational sources of stress include:
- task demands, role demands, inter-personal demands, sexual harassment and work-family
  - role demands, economic demands, cultural demands, bullying and legal
  - task demands, cultural demands, legal demands, technological and bullying
  - sexual harassment, bullying, lack of motivation, team conflict, legal
- 21) Employees learn culture through:
- Symbols, stories, heroes, rituals, jargons and statements of principle
  - Symbols; precepts, stories, structure and rewards
  - Rites, rituals, villains, structure and rewards
  - Jargons, values, symbols, heroes and processes

- 22) Lencioni defines 5 dysfunctions of team in this chronological order namely:
- a) Absence of trust, fear of conflict, avoidance of accountability, inattention to details & lack of commitment
  - b) Absence of trust, avoidance of accountability, fear of conflict, lack of commitment & inattention to details
  - c) Absence of trust, fear of conflict, lack of commitment, avoidance of accountability & inattention to details
  - d) Absence of trust, lack of commitment, avoidance of accountability, lack of conflict & inattention to details
- 23) Integrative bargaining is characterized by
- a) Win-lose
  - b) Lose-lose
  - c) Win-win
  - d) Win-loose
- 24) It is Black Friday. Several people are waiting outside the popular electronics store for someone to unlock the doors. These people constitute a(n) \_\_\_\_\_.
- a) formal group
  - b) informal group
  - c) social group
  - d) crowd
- 25) Which one of the following stages in group development involves defining the group's structure and leadership?
- a) norming
  - b) storming
  - c) performing
  - d) forming
- 26) A team has been established to solve a problem with an industrial adhesive used by the firm. The three members are the installer, an engineer, and the sales representative for the adhesive manufacturer, but the team does not have a specific leader. This team can be called a \_\_\_\_\_ team.
- a) problem solving
  - b) self-managed
  - c) virtual
  - d) functional
- 27) The \_\_\_\_\_ stage in the group development process is complete when members begin to think of themselves as part of a group.
- a) forming
  - b) storming
  - c) norming
  - d) performing

28) It became clear that both Catherine and Simon felt they should lead the group. Other group members began aligning themselves with one or the other. This group is in the \_\_\_\_\_ stage.

- a) forming
- b) norming
- c) storming
- d) performing

29) For a new project, Edward forms a team of individuals from various functional departments. After a few days Edward observes conflicts within the group over who will control it and what the group needs to be doing. This team is now in the \_\_\_\_\_ stage of group development.

- a) storming
- b) forming
- c) performing
- d) norming

30) In this meeting, the group is discussing a code of conduct to be observed by all members, such as arriving on time and not interrupting the speaker. This group is in the ..... stage.

- a) forming
- b) norming
- c) storming
- d) performing

31) Group C has been meeting for two months and seems to be progressing extremely well. You observe that the group meets every morning and spends the first five minutes chatting. They then review the decisions of the last meeting followed by a discussion on the status of their current tasks. Group C is currently at the ..... stage.

- a) norming
- b) performing
- c) storming
- d) adjourning

32) Which one of the following is considered to be the last stage of group development for permanent work groups?

- a) performing
- b) norming
- c) storming
- d) adjourning

33) Sandra is a single mom and the administrative assistant for the marketing department. Her son's soccer games begin right after school so Sandra often has to choose between supporting her son at his games and working. Sandra is experiencing role \_\_\_\_\_.

- a) overload
- b) ambiguity
- c) conflict
- d) clarity

34) Stacey was invited to become a member of the class project team because the other members knew she had a high GPA and worked hard on all her individual assignments. Although the other members worked diligently to complete their parts, Stacey was not giving her best effort to this team. Which of the following is a possible explanation for Stacey's behavior?

- a) social loafing
- b) social incompetence
- c) role ambiguity
- d) group cohesiveness

35) Daniela and Nicholas disagree on the best way to promote a new product. Those in the company who view the conflict over the promotion strategy as natural and inevitable have a(n) \_\_\_\_\_ view of conflict.

- a) human relations
- b) reactionist
- c) traditional
- d) interactionist

36) Which one of the following types of conflict is most likely to be dysfunctional?

- a) status conflict
- b) relationship conflict
- c) process conflict
- d) task conflict

37) Mandy is a party animal, loud, friendly, bluntly outspoken. Megana is quiet, tactful, and clearly disapproving of Mandy's lifestyle. It's no wonder the two do not work well together. This is a type of \_\_\_\_\_ conflict.

- a) task
- b) process
- c) relationship
- d) interpersonal

38) In which one of the following conflict resolution techniques are conflicts resolved by seeking an advantageous solution for all the parties involved?

- a) collaborating
- b) compromising
- c) forcing
- d) accommodating

39) The typical interaction between a buyer and seller of a car in which offers are made and countered is an example of \_\_\_\_\_.

- a) collaborating
- b) forcing
- c) compromising
- d) accommodating

40) Which one of the following is true for the communication process?

- a) The decoding process takes place within the channel.
- b) Noise cannot affect the encoding of the message.
- c) Encoding takes place before the message reaches the medium.
- d) The sender decodes the message and then transmits it

41) Adam has to tell the members of his department that the office hours have changed from flexible hours to a strict nine-to-five day. He calls a meeting to explain the change. Participants begin arguing and asking multiple questions about the new work time policy. The next day, Adam realizes that most people still do not have a clear idea about the change, as a result of the confusion at the meeting. Which one of the following explains why the message was not understood?

- a) The sender did not decode the message appropriately.
- b) The recipients did not encode the message correctly.
- c) The noise in the process interfered with the transmission of the message.
- d) The channel was not appropriate for the delivery of this message.

42) The purchasing manager assigned to the team had already worked with Dan in the past. However, a difference of opinion had soured their relationship. As a result, the purchasing manager is unable to objectively evaluate and appreciate the various aspects of the current project described in the memorandum Dan prepared. This is an example of \_\_\_\_\_.

- a) noise
- b) framing
- c) filtering
- d) distraction

43) Laura sent a text message to Betty telling her that she would come by to pick her up after work so they could go shopping. Betty, however, made other plans for the evening thinking Laura was talking about going shopping the next day. Which one of the following best explains what went wrong with the communication?

- a) Laura used a wrong channel of communication.
- b) There was too much noise in the room when Betty read the message.
- c) Betty decoded the message incorrectly.
- d) The complexity capacity of text messaging is poor.

44) By the time that Sandra had finished the presentation to the employees, she had spoken for one and one-half hours, shown 14 visual aids, and no one asked a question. The employees were probably dealing with which one of the following barriers to effective communication?

- a) information overload
- b) selective perception
- c) defensiveness
- d) cultural constraints

45) When a person tells his or her manager what the manager wants to hear, which one of the following barriers to effective interpersonal communication is the person using?

- a) filtering
- b) selective perception
- c) framing
- d) defensiveness

46) Sarah needs funding to research the efficacy of a certain drug for the treatment of cancer. Though her initial trials have been inconclusive, Sarah is sure that the drug will prove to be effective. However, the organizations she plans to approach for funding will not be very impressed with the results of the previous trials and may withhold funding. Sarah decides to structure her proposal in such a way that she emphasizes the positives about the drug and minimizes the negative information. Which one of the following best describes Sarah's technique for writing her proposal?

- a) framing
- b) filtering
- c) emotional appeal
- d) information overload

47) When Terrence explained to the employees why layoffs were necessary, he spoke about return on investment, debt, and cash flow—terms his shareholders clearly understood. But his employees had no clue what he meant. Terrence's explanation would have been more effective if he had \_\_\_\_\_.

- a) used flow charts and other visuals
- b) skipped the reasons and explained the method of selection for layoffs
- c) spoken louder
- d) tailored the language to the audience

48) The \_\_\_\_\_ communication system within an organization permits employees to satisfy their need for social interaction with their peers.

- a) informal
- b) social
- c) formal
- d) organizational

49) In an effort to improve communication within the accounting department of a large organization, the department head puts a suggestion box at the door and invites employees to communicate their thoughts, ideas, concerns, or grievances to the managers in the department. Which one of the following methods of communication is he encouraging?

- a) upward
- b) diagonal
- c) downward
- d) lateral

50) Many production employees began to talk among themselves about whether they wanted to transfer to a new production facility in a neighboring town. What type of communication is this?

- a) diagonal
- b) formal
- c) lateral
- d) downward

### **Section B: Short Answers. Answer all questions (30 marks)**

1. Examine some four ways employees can express negative inequity ? (4 marks).
2. Identify the different dimensions of “Big Five” model of personality (2.5 marks).
3. In an organization, communication flows in various forms consisting of ..... (2 marks)
4. Name three thought oriented and action oriented roles as outlined by Belbin (3 marks)
5. Organizational commitment is categorized into 3 forms. Examine these .....(3 marks)
6. The competing values framework defines four types of cultures namely..... (4 marks)
7. Edgar Schein defined 3 levels of culture namely ..... (3 marks)
8. Merhabian model defines communication as a function of: ..... (3 marks)
9. During a typical bargaining process, which dynamics takes place (2.5 marks).
10. Flexible working arrangements comprises ..... (2 marks)
11. One major difference between the human relations and the interactionist view of conflict is ..... (1 mark)

### **Section C: Choose any one (15 marks each)**

1. I am not a team player. I work best when I work alone and am left alone,” says MaryAnn. MaryAnn’s employer, an office furniture manufacturer, recently reorganized around teams. All production in the company’s Legon’s factory is now done in teams. MaryAnn’s design department has been broken up into three design teams. “I have worked here for four years. I am very good at what I do. And my performance reviews confirm that. I have scored 96 percent or higher on my evaluations every year. But now everything is changing. I am expected to be part of our modular-office design team. My evaluations and pay raises are going to depend on how well the team does. And, get this, 50 percent of my evaluation will be on how well I facilitate the performance of the team. I am really frustrated and demoralized. They hired me for my design skills. Now they are forcing me to be a team player. This does not play to my strengths at all.”
  - a) In your perspective, how can MaryAnn’s team be made to work effectively? (15 marks)
2. a) In response to massive layoffs in the 1990s, GhanaBa employees became unhappy and sought ways to press grievances against the company and protect their jobs. Employees were kept out of the loop, felt they were not respected, and looked to alternative arrangements to get their voices heard by management. The communication breakdown led to a major conflict between the employees and the company’s CEO. What can be done about conflict to make sure it does not get out of control? Examine the conflict-handling mechanisms, giving the title of each and the cooperative and assertiveness dimensions of each. (10 marks)
  - b) One of the members of your team continually arrives late for meetings and does not turn drafts of assignments in on time. In general this group member is engaging in social loafing. What can the members of your group do to reduce social loafing? (5 marks)

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Campus: .....



UNIVERSITY OF GHANA

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BSC. ADMINISTRATION FIRST SEMESTER EXAMINATIONS: 2017/2018

UNIVERSITY OF GHANA BUSINESS SCHOOL

OHRM 303: HUMAN BEHAVIOUR IN ORGANISATIONS (3 CREDITS)

**INSTRUCTIONS:**

**ANSWER ALL QUESTIONS IN SECTION A AND SECTION B**

**ANSWER SECTIONS A AND B ON THE QUESTION PAPER**

**TIME ALLOWED: TWO AND A HALF HOURS (2½ HOURS)**

**SECTION A**

**ANSWER ALL QUESTIONS IN THIS SECTION**

**WRITE OUT YOUR RESPONSE IN THE SPACES PROVIDED. EACH RESPONSE  
IN THIS CATEGORY ATTRACTS 2 MARKS**

1. List 5 factors that influence interactive behavior at work

.....  
.....

2. What core skills are needed to interact effectively at work?

.....  
.....

3. Which theories help to explain why and how people interact at work?

.....  
.....

4. Name two main criteria for successful people perception

.....  
.....

5. List 5 processes specific to observing people at work.

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.....

6. Name 4 perceptual errors you know.

.....  
.....  
.....

7. List Hofstede's cultural dimensions.

.....  
.....

8. In which ways can the concept of understanding others be applied at work?

.....  
.....

9. What forms can communication take?

.....  
.....

10. List 5 functions of communication.

.....  
.....

11. What are speech acts?

.....  
.....

12. List 4 barriers to communication that are set up by individuals.

.....  
.....

13. In which areas of work can persuasion be applied?

.....  
.....

14. List 5 perceptual errors you know.

.....  
.....

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Campus.....

15. When the demands made by the organization or a manager conflict with the basic values of the individual, the person suffers from .....

16. What kind of power can a subordinate exert towards a supervisor?

.....  
.....

17. Name the types of matrix organisations.

.....  
.....

18. What are the four major personality types that you are likely to find in organisations?

.....  
.....

19. What is a person job-fit?

.....  
.....

**CIRCLE THE CORRECT ANSWER. EACH CORRECT RESPONSE ATTRACTS 1 MARK**

20. You are the most likely to encounter perceptual problems when the stimulus to be perceived has a(n)

- a. negative quality.
- b. familiar look.
- c. emotional quality.
- d. physiological nature

21. Stereotypes can lead to perceptual errors in evaluating another person because we

- a. are overly influenced by one positive trait about the individual.
- b. are overly influenced by one negative trait about the individual.
- c. tend to believe that person has the same faults we do.
- d. tend to ignore the uniqueness of the individual.

22. Because Ashley has a winning smile, you uncritically accept her technical suggestions.

Your perception is being influenced by

- a. the halo effect.
- c. stereotyping.
- b. denial.
- d. expectancy.

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23. Ethics has mostly to do with
- a. the legality of a person's actions.
  - b. how hard people work.
  - c. the moral choices a person makes.
  - d. business etiquette and manners.
24. According to attribution theory, people tend to attribute failure to themselves and success to forces in the environment. TRUE/ FALSE
25. A person's values typically change daily, depending on his or her mood. TRUE/FALSE
26. Common ethical problems include lying to customers, offering or accepting bribes and kickbacks, and the use of corporate resources for personal gain. TRUE/FALSE
- What types of perceptual errors might be involved in the following common judgements?
27. A talkative person is judged less responsible than a quieter individual. ....
28. An older worker fears that his skills may be becoming obsolete states that the new recruit have no respect for experience. ....
29. A manager ignores signs of stubbornness and rejection coming from Joe, who is normally compliant, but immediately registers any indications of lack of acceptance from Sue, who is normally difficult? .....

**SECTION B**

**ANSWER ALL QUESTIONS FROM THIS SECTION**

**WRITE BRIEF NOTES ON THE FOLLOWING (5 MARKS EACH)**

1. Organisational forms and cultures.

.....

.....

.....

.....

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2. Identify and briefly describe the environmental factors that influence workplace interactions.

- ### 3. Intercultural sojourning

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Campus.....

4. A successful young English corporate lawyer, working for an American bank in London said she was experiencing serious difficulties with the style of the Indian whose desk adjoined hers. "He was recruited in Bangalore. He is a good mathematician and computer software designer. However, unlike previous Indians I've worked with, he's not been 'Westernised' by going to business school or having similar experiences. He interrupts me all the time when I am in the middle of a complex drafting operation to ask me questions such as 'Is your hair naturally blonde?' and 'How do men and women in this country meet their parents?' I'm really upset by it, for several reasons. First, he distracts me from my work. Then, I resent his sexism. Other people in the office hear this going on, so unless I slap him down, I'm going to lose authority generally. On the other hand, I feel I should try to make allowances. Apart from the fact that he comes from a culture where women are rarely seen in positions equal or superior to his own, he is lonely and far from home. I think there's some sexism in management having placed him at my desk. There's little overlap in our work. I think they think I'll mother him".

Identify and explain the personality types in the given organizational situation.



**UNIVERSITY OF GHANA**  
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**FIRST SEMESTER: 2016/17**

**UNIVERSITY OF GHANA BUSINESS SCHOOL**  
**BACHELOR OF SCIENCE IN ADMINISTRATION (BSc.)**

**OHRM 303: HUMAN BEHAVIOUR IN ORGANISATIONS (Three Credits)**

**Level 300**

**TIME ALLOWED: Two and a half (2½) hours**

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**Please Read These Instructions Carefully:**

**This paper has two sections:**

**Section A (Main Campus only)**

**and**

**Section B (City Campus only)**

**Please Indicate your Course Code and Index Number on the Answer Booklets**

**All the best!**

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**Examiners: Dr. Yvonne A. Lampsey, and Mr. Aaron M. Ametorwo**

**Page 1 of 6**

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## SECTION A (MAIN CAMPUS ONLY)

### ANSWER ALL QUESTIONS

#### Question One

##### *Case*

A successful young English corporate lawyer, working for an American bank in London said she was experiencing serious difficulties with the style of the Indian whose desk adjoined hers. "He was recruited in Bangalore. He is a good mathematician and computer software designer. However, unlike previous Indians I've worked with, he's not been 'Westernised' by going to business school or having similar experiences.

He interrupts me all the time when I am in the middle of a complex drafting operation to ask me questions such as 'Is your hair naturally blonde?' and 'How do men and women in this country meet their parents?' I'm really upset by it, for several reasons.

First, he distracts me from my work. Then, I resent his sexism. Other people in the office hear this going on, so unless I slap him down, I'm going to lose authority generally.

On the other hand, I feel I should try to make allowances. Apart from the fact that he comes from a culture where women are rarely seen in positions equal or superior to his own, he is lonely and far from home. I think there's some sexism in management having placed him at my desk. There's little overlap in our work. I think they think I'll mother him".

Answer the questions that follow: (Each response under *question one* should not exceed half (1/2) a page)

- 1A. What personality types do you identify in the case? Explain them. (5 Marks)
- 1B. What weaknesses are associated with the personality types you have identified? (5 Marks)
- 1C. Identify and explain the kind of power that the English corporate lawyer can use in the given situation. (10 Marks)
- 1D. Describe the perceptual error (s) you can identify above. (10 Marks)
- 1E. Mention and explain the structural relationship(s) that you can identify in the given work context. (10 Marks)
- 1F. What is the likely cause of stress for the lawyer? (10 Marks)

## **Question Two**

*(Your response for any question should not exceed one page)*

"Informal groups emerge without being officially designated by the organisation. They form spontaneously, not by any specific organisational endorsement".

- 2A. With your experience from your visit to organisations during this semester, identify and explain five (5) ways in which informal groups are formed within organisations.  
(10 Marks)
- 2B. Group conformity pressures can lead to "groupthink" and "cautious shifts". Explain groupthink. (10 Marks)

**SECTION B (ACCRA CITY CAMPUS ONLY)**

**INSTRUCTION: ANSWER ALL QUESTIONS.**

**FASTEN THE QUESTION PAPER TO THE ANSWER BOOKLET BEFORE SUBMISSION. BE SURE TO HAVE YOUR INDEX NUMBER CLEARLY WRITTEN ON THE QUESTION PAPER.**

**Part A: Fill in the blank spaces with the appropriate answer. Use the question paper for this Section.**

1. The two categories of individual differences are:
  - a. \_\_\_\_\_, and
  - b. \_\_\_\_\_ (2 marks)
2. Richmond is very diplomatic in his approach to work and in relating with others. Even in the midst of tension, his choice of words are carefully tuned to ensure that calm is restored. He does not talk "by-heart" but considers and values the feelings of others. In terms of *self-monitoring* as an organizationally-relevant personality trait, Richmond can be described as a/an \_\_\_\_\_ (3 marks)
3. Another name for cognitive ability is \_\_\_\_\_ (2 marks)
4. Physical ability is made up of \_\_\_\_\_ skill and \_\_\_\_\_ skill. (2 marks)
5. The ability to understand and manage one's own feelings and emotions and the feelings and emotions of others is referred to as \_\_\_\_\_ (3 marks)

6. In the following table, one column lists certain employee behaviours considered to be deviant. You are required to state the type of workplace deviance in the adjoining column. (4 marks)

| No. | Employee behaviour  | Type of workplace deviance |
|-----|---|----------------------------|
| a.  | Unhealthy and non-beneficial competition; favouritism     |                            |
| b.  | Closing earlier than normal; intentionally working slowly |                            |
| c.  | Endangering fellow workers; verbal abuse                  |                            |
| d.  | Sabotaging company equipment; stealing from company       |                            |

7. Sexual harassment may take any of two forms, namely:

- a. \_\_\_\_\_, and  
 b. \_\_\_\_\_ (2 marks)

8. Mention four examples of high-performance work practices:

- a. \_\_\_\_\_  
 b. \_\_\_\_\_  
 c. \_\_\_\_\_  
 d. \_\_\_\_\_ (4 marks)

9. In terms of resistance to change [general/specific], self-interest, misunderstanding, and mistrust relate to \_\_\_\_\_ resistance, while \_\_\_\_\_ resistance manifests in timing, peer-pressure and surprise.  
 \_\_\_\_\_ (2 marks)

10. When Eleanor entered Mr. Kumah's office for the first time, she was in very short skirt, had a chain around her ankle, and had thick lipstick with heavy make-up. From what Mr. Kumah saw, he concluded that Eleanor was an indecent lady. His conclusion was based on information he already knows about strategic flirting, however, his conclusion may not be necessarily accurate. *Thus Mr. Kumah has a perception problem referred to as* \_\_\_\_\_ (3 marks).

11. Miss Susan Kyei is one of the Supervisors at the Legon Mills, a company that processes cereals on a large scale. One of the challenges that her subordinates have about her is that she never takes excuses for mistakes committed. In fact, she blames them squarely for their mistakes even when it is obvious that some external factors or situations beyond the control of her subordinates may have caused the mistake or problem. *Miss Kyei has a perception problem known as* \_\_\_\_\_. (3 marks)

**Part B: Use the answer booklet for this Section.**

1. Briefly explain what is meant by personality being *relatively stable*. (4 marks)
2. a. State the Vision and Mission of the University of Ghana Business School (UGBS) (6 marks)  
b. Using any organizationally-relevant approach, suggest how the Vision and Mission of UGBS can be attained (8 marks)
3. Explain the following as possible outcomes of any selection decision (2 marks each).
  - a. Reject error
  - b. Accept error
4. Having worked in your current position as Human Resource Assistant for the past seven months, you have observed that there seem to be a somewhat weak culture in the organization.
  - a. Mention four (4) signs of a weak organizational culture (4 marks)
  - b. Write a *Memorandum* to the Managing Director (copied to the Human Resource Manager), suggesting three (3) ways to strengthen organizational culture. [NB: Go straight to the point for each suggestion] (8 marks)
5. Meyer and Allen (1991) classified employee commitment into three: affective, normative and continuance. Briefly explain these three forms of commitment in terms of: "ought to", "need to", and "want to". (6 marks)



## UNIVERSITY OF GHANA

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### BSc. ADMINISTRATION

FIRST SEMESTER EXAMINATIONS: 2015/2016

OHRM303: HUMAN BEHAVIOUR IN ORGANISATIONS  
THREE (3) CREDITS

**INSTRUCTIONS:**

**ANSWER ALL QUESTIONS**

**USE THE ANSWER BOOKLET PROVIDED FOR ONLY SECTIONS 'A' & 'B';  
QUESTIONS IN SECTION 'C' SHOULD BE ANSWERED ON THE QUESTION PAPER.**

**TIME ALLOWED: TWO HOURS & THIRTY MINUTES (2<sup>1</sup>/<sub>2</sub> HRS)**

STUDENT ID#: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

CAMPUS: MAIN [  ] CITY CAMPUS [  ]

DATE: \_\_\_\_\_

All the Best!

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## **SECTION A: Case Application.**

Use the answer booklet for this Section.

### ***Gossip Girls***

Sixty percent! That's the percentage of respondents in a recent employee survey who said that gossip was their pet peeve about their jobs. Most gossip revolves around the workplace and the personal lives of coworkers. How often have you gossiped at work ... either as a sender or receiver? Although you may think workplace gossip is harmless, it can have some pretty serious consequences.

First, spreading rumours can damage morale and increase anxiety. Secondly, it can hamper productivity and affect performance. And it can lead to something you might not even have considered, as it did to four former employees of the town of Leghon. Fired by the city authorities for gossiping about their boss, they learned the hard way that gossip can cost you your job.

The longtime employees were fired because one of the women had used derogatory terms to describe the town administrator and because all of them had discussed a rumour that he was having an affair with a female subordinate. All four of the women acknowledged feeling resentment toward the woman, who worked in a specially created position and was paid more than two of the employees, despite having less experience and seniority.

Although the four employees made an appeal of their dismissal, the Leghon authorities did not budge and stated, "... these employees do not represent the best interests of the town of Leghon and the false rumours; gossip and derogatory statements have contributed to a negative working environment and malcontent among their fellow employees." Despite national media attention and a petition signed by 407 residents asking for the women to be reinstated, the city council did not waver on its decision. An attorney for the four women said that his clients were "legitimately questioning the conduct of their supervisor, and whether the female subordinate was getting preferential treatment. It also cheapens to call it a gossip; it might have been idle, not particularly thoughtful, talk. But there was no harm intended."

Although the four women represented nearly 50 years of combined service to the city and all had positive performance reviews, the town council believed that the women's actions were "insubordinate" and "dishonest." All four received a settlement for being fired, which cost the town a total of GH¢126,000. The settlement agreement also stipulated, however, that two of the women can never apply for a job with the town again.

### **Questions**

1. The case has largely mentioned "gossiping". State and briefly explain the communication channel under which "gossiping" falls. (3 marks)
2. State and explain one example of such channel of communication. (2 marks)
3. Mention five (5) strategies these four women fired could have done to avoid the action by the city authorities. (5 marks)

SECTION B: Indicate whether the following statements are TRUE or FALSE, and in the case where the statement is FALSE, give your reason in one sentence.  
Use the answer booklet for this Section. (19 marks)

1. The immediate external environment of any group in an organization is the organization itself.
2. The most general dimension of cognitive ability is reasoning skill.
3. The ability to physically manipulate objects in the environment is referred to as spatial skill.
4. Physical skill is made up of physical ability and motor skill.
5. Many abilities exist but not all are relevant in every situation.
6. All teams are groups but not every group is a team.
7. After the faulty action stage of organizational decline, it is irreversible to get the organization back to its feet.
8. Noise in communication always refers to loud, high-pitched or high-volume sounds that obstruct the transmission of an intended message.
9. Downward, upward and lateral communication are all examples of vertical communication.
10. Paralanguage constitutes 38% of messages transmitted while kinesics constitute 55% of such transmitted message.

**SECTION C: Case Scenarios and Fill-Ins**

*In this section you are required to fill in the blank spaces with the appropriate terms.  
(1 mark for each space correctly filled)*

1. There is vacancy for the position of School Counsellor at the Universal Senior High School. As part of its job specification, management wants to hire an individual who has the ability of self-managing emotions and that of students and staff who seek counseling. What is the name of such ability?

- 
2. In order to ensure a balance between abilities of individuals and the work they do, three fundamental approaches can be used. They are: i) \_\_\_\_\_, ii) \_\_\_\_\_, and iii) \_\_\_\_\_.

3. The act of employees willfully stealing the merchandise of their company is termed \_\_\_\_\_.

*Indicate the type of workplace deviance that best explains each of the following scenario (Questions 4-7).*

4. Alberta started work with Forever Assurance Ltd. two years ago and was regarded as a dedicated employee. Lately it has been observed that she no longer has so much passion for the business of the company. She is usually late or often absent, and wastes resources unnecessarily. This is an example of \_\_\_\_\_ deviance.
5. Gradually, unhealthy and unproductive competition has crept into the 'tent' of the business. Instead of focusing on work-related affairs, Haruna and Sadiq are just bent on releasing the latest and most expensive mobile phones, and instead of calling them to order, their boss, Alhassan, is siding with Sadiq. This is an example of \_\_\_\_\_ deviance.
6. It has come to light that many of the medical officers at Alive Teaching Hospital own either private clinics, laboratories or pharmacies in town. As a result, all new and modern equipment procured to cater for certain medical conditions are intentionally destroyed, thereby compelling them to refer the cases to their private centers. Some of the medical staff even steal drugs and other medical equipment belonging to the hospital for use in their private centers. This is a clear case of \_\_\_\_\_ deviance.
7. Lucas is making life so unbearable for the young female employees. Because of his position as General Manager, he often harasses the ladies sexually, and would use unkind words at anyone who resisted his attempts to fondle or touch. This is \_\_\_\_\_ deviance.

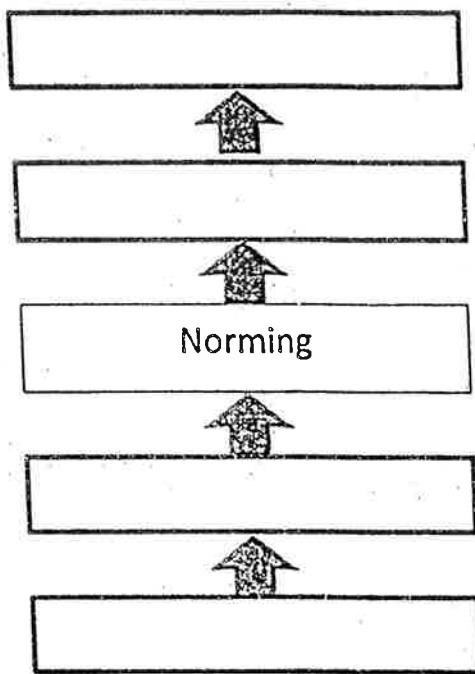
8. Indicate in the appropriate column the stage of organizational decline associated with each issue.

| #  | Issue  | Stage of Organisational Decline |
|----|--|---------------------------------|
| a. | The stage when managers are not proactive in dealing with problems that arise but hope that situations will normalize by default. Simply, there is no urgency for the situation at hand. |                                 |
| b. | The stage when the organization is short of resources required to turn things around. Eventually some staff are laid off.  |                                 |
| c. | The stage when management is unwilling to explore other alternative solutions but is bent on implementing an alternative assumed to be the panacea to the problem.                       |                                 |
| d. | The stage when managers are naïve about the possibility of situations around them that are likely to result in gradual decline of the organization.                                      |                                 |

9. The \_\_\_\_\_ view of conflict states that although conflicts are unavoidable, they should have a positive force to enhance performance. The \_\_\_\_\_ view of conflict indicates that some amount of conflict is absolutely necessary for groups to perform effectively. In the case of the \_\_\_\_\_ view, conflict is simply counter-productive and must be avoided at all cost.

10. In order to maintain group cohesiveness, seek concurrence, and avoid unnecessary in-group fighting, faulty decisions are arrived at sometimes. This makes them blind to alternate opinions that could disrupt group harmony. This is a phenomenon referred to as \_\_\_\_\_.

11. Indicate the order in which groups develop in the figure below:



12. A choice made in the midst of available alternatives is termed \_\_\_\_\_, whereas \_\_\_\_\_ is the cognitive dimension involved in making such choices.

13. Yielding to pressure from a group so as to behave in a certain way, thus gain acceptance by group members is referred to as \_\_\_\_\_.

14. In any group, there are standards that are shared by all members. These standards are referred to as \_\_\_\_\_.

15. Usually when working in groups, some individuals expend less effort towards the group task but put in more efforts when working alone. This phenomenon is referred to as \_\_\_\_\_.

16. Status is a prestige grading, position or rank within a group. The two forms of status are: \_\_\_\_\_ and \_\_\_\_\_.

17. The upsurge in technology has made it possible to have team members in diverse geographical regions to still interact and work. This is the type of team known as \_\_\_\_\_.

18. At each level in the process of perception, certain personality-based differences or experience-based differences greatly influence how stimuli is attended to, and eventually retained. These differences are referred to as \_\_\_\_\_.

19. Freda Mambo, the Marketing Manager of Asibi Savings and Loans Ltd., has set targets for her marketing assistants and expects them to meet such targets by the last working day of November, 2015. Just three days to the deadline, she gathers that not even one of the twelve marketing assistants has met half of the targets. Although it is obvious that the required logistics for effective performance have not been provided, Freda is very upset and calls the marketing assistants "lazy" and "incompetent" for their poor performance. This is an example of an error in perception of others (by Freda) known as \_\_\_\_\_.

20. During a staff meeting, Patrick Nakaar, the General Manager of Q&C Ltd., announced that budgets would be cut by about 35% very soon. Some staff have interpreted this announcement to mean possible employee layoffs. These staff have concluded rather quickly, but their conclusion is not the true intention of management of Q&C Ltd. The behavior of the staff is a classic example of a perception problem known as \_\_\_\_\_.

21. There is a fundamental problem with Kwame Kasch, and as a result no one is prepared to comment on anything he does. Over the past years, it has been observed that Kwame easily gets angry at anyone who attempts to correct him whenever he goes wrong. He again expects to be highly praised for the least good deed he does. He always wants his value as a worker to be overestimated by attributing success to himself and attributing failures to external sources. Indeed, Kwame's issue is an example of a communication problem of self-perception referred to as \_\_\_\_\_.

22. After each of the following statements, write the appropriate term in Expectancy theory:

- a. At last Trisha has been promoted as Senior Administrative Staff at UGBS, and she places a lot of worth on this milestone of her career.  
\_\_\_\_\_
- b. The good news is that Eugene has been offered a new appointment as Marketing Manager at Amos & Quito Ltd. He acknowledges that once he works hard, success will never elude him in his new role.  
\_\_\_\_\_
- c. Evans has indeed put in so much effort ever since he was employed two months ago. He has now exceeded his targets, an achievement worth celebrating. Evans now believes that with such achievement, he will be promoted very soon.  
\_\_\_\_\_

23. Communicating with someone for the direct purpose of enhancing the person's on-the-job performance or behavior is referred to as \_\_\_\_\_;

on the other hand, communicating with someone about non-job-related issues that may be affecting or interfering with the person's performance is called \_\_\_\_\_.

24. A manufacturing entity is set up primarily to produce goods for use by consumers. Such primary function of a manufacturing entity is referred to as \_\_\_\_\_ function whereas \_\_\_\_\_ functions are those activities (such as corporate social responsibility) that the entity undertakes as a form of social intervention.

25. Functional and dysfunctional conflicts are two types of conflict under the \_\_\_\_\_ view of conflict.

26. Under the Grievance Procedures of the University of Ghana's Anti-Sexual Harassment Policy (2010), there are two main approaches applied in handling sexual harassment complaints. They are:

- i) \_\_\_\_\_, and  
ii) \_\_\_\_\_.

For each of the following statements (Questions 27-31), indicate the form of reinforcement or punishment that apply.

27. Sylvester has been found guilty of embezzling huge sums of money meant for the company's annual social intervention programme. Consequently, management has taken a decision to relieve him of his position as fund manager. This move was to serve as deterrent to other staff. This is an example of \_\_\_\_\_.

28. Theresa's excellent performance on the job has greatly impressed her boss, Mr. Frank Yowome. As a way of rewarding her and to encourage her to do even better, Frank has offered to cater for Theresa's lunch for one whole month and in addition, buy her a brand new laptop to further aid her work. This case is an instance of \_\_\_\_\_.

29. "What is going on here? Has this room now turned into a movie center or what?!", boomed Mr. Asare, Principal of Penguin International School, when he got to the staff common room and met most of the teachers gathered around a 14-inch television set, watching La Tiger, a popular series. Later in the day, Mr. Asare ordered for the removal of the television set from the staff common room so that teachers focus more on work and enhance effectiveness in their work. This case is an example of \_\_\_\_\_.

30. Mrs. Nortey is the Head of the Human Resource Division of NAC Bank Ltd. One morning she called into her office, three subordinates who for the past six weeks have shifted to a rather "negative gear" in terms of their punctuality to work. She thought it prudent to call them to order; in fact, she scolded them so well and expressed her disappointment at their negative attitude towards work. Mrs. Nortey's aim was to ensure that they changed their habit of lateness to that of punctuality. What Mrs. Nortey did is an example of \_\_\_\_\_.

31. Elnathan is a very good presenter, but usually gets distracted whenever his phone was with him. Before entering the conference room for a crucial meeting, his boss, Mr. Alex Nuamah, gently seized his phone. Mr. Nuamah did this in order to get Elnathan to fully concentrate on the meeting and also do an excellent presentation on behalf of the company. In terms of reinforcement or punishment, this is a clear case of \_\_\_\_\_.

*After each scenario/example from Questions 32-35, indicate the appropriate personality trait, using the Big Five Traits.*

32. It is so easy working with Herbert; he not so controversial but is kind-hearted and understanding. \_\_\_\_\_

33. From her home to her car, and office, Hilda is very careful in the manner in which she arranges her items. In the office, she knows exactly where every item is, such that even when blind-folded, she can still pull out a document of her choice. \_\_\_\_\_

34. Edem's inclusion in the planning committee is so appropriate; she always has a lot to share on issues on board for discussion. \_\_\_\_\_

35. No party can be complete without Rhoda's presence. She has the natural ability of making everyone feel at ease because she is easygoing and freely interacts with every guest. No one can beat her to that! \_\_\_\_\_

*Indicate the type of Locus of Control or Self-Monitoring being referred to in the following scenarios (Questions 36 & 37).*

36. Bright has really annoyed everyone in the office. Last week, the team he led to negotiate new working conditions with the Minister of Labour failed woefully, and instead of taking full responsibility for his poor negotiation abilities, he is rather blaming other team members for not lending him support when he was struggling. This is an example of \_\_\_\_\_.



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## UNIVERSITY OF GHANA BUSINESS SCHOOL

# **FIRST SEMESTER EXAMINATIONS, 2014/2015**

OHRM 303: HUMAN BEHAVIOUR IN ORGANISATIONS

**THREE (3) CREDITS**

### **(MAIN CAMPUS & CITY CAMPUS)**

**TIME ALLOWED: TWO (2) HOURS**

## **INSTRUCTIONS:**

**ANSWER ALL QUESTIONS ON THE QUESTION PAPER; ATTEMPT ALL**

## **SECTION A: MULTIPLE CHOICE QUESTIONS**

**Circle or underline the correct response in each question. (10 Marks)**

1. To qualify as an organization, the following must exist except:
    - a. People
    - b. System
    - c. Goals
    - d. Relationships
  
  2. Common traits, as advanced by Allport (1974), include the following except.
    - a. Social
    - b. Economical
    - c. Theoretical
    - d. Environmental
  
  3. The assumption of the classical theories was that man pursues \_\_\_\_\_ goals.
    - a. Political
    - b. Economic
    - c. Relational
    - d. Social

4. Repetitive activities that are undertaken to remember unique events in organisations are known as:
- a. Ceremonies
  - b. Anniversaries
  - c. Rituals
  - d. Fables
5. As one of the drivers of organizational culture, \_\_\_\_\_ refer(s) to stories of success or progression of organisations in terms of recruitment, decision making and leadership behavior.
- a. History
  - b. Corporate novels
  - c. Fables and tales
  - d. Organizational riddles
6. In communication, the sender is often referred to as the \_\_\_\_\_.
- a. Encoder
  - b. Transmitter
  - c. Decoder
  - d. Messenger
7. In communication, it is important to ensure that the message being sent is meaningful and significant. This follows the principle of:
- a. Simplicity
  - b. Relevance
  - c. Focus
  - d. Organization
8. Many organisations encourage communication among employees regardless of their work area or level on the organizational structure. Thus the communication that crosses both work areas and organizational levels is referred to as:
- a. Upward communication
  - b. Lateral communication
  - c. Downward communication
  - d. Diagonal communication
9. Paying attention to auditory stimuli is very important in communication. \_\_\_\_\_ refers to active attention paid to spoken words in order to make meaning out of it while \_\_\_\_\_ is passive attention to auditory stimuli.
- a. Hearing/listening
  - b. Listening/hearing
  - c. Coordination/cooperation
  - d. Cooperation/coordination
10. Non-verbal sounds that convey meaning during communication are together referred to as:
- a. Vocalisations
  - b. Vocal characterisers
  - c. Vocal segregates
  - d. Paralanguage
11. There are three key elements contained in the definition of motivation, which are the following, except:
- a. Direction
  - b. Energy
  - c. Reward
  - d. Persistence



## SECTION B

Fill in the blank spaces with the correct answers. (47 marks)

1. Another name for organizational culture is \_\_\_\_\_.
2. In \_\_\_\_\_ culture, the job description is often more important than the one who fills it.
3. List the stages of group development as advanced by Tuckman and Jensen (1977).
  - i. \_\_\_\_\_
  - ii. \_\_\_\_\_
  - iii. \_\_\_\_\_
  - iv. \_\_\_\_\_
  - v. \_\_\_\_\_
4. In the *redesigning job design* approach to designing motivating jobs, two views on job design have emerged. Which of these views or perspectives focuses on how people's tasks and jobs are increasingly based on social relationships? \_\_\_\_\_.
5. When communicating, it is necessary to restate certain key points of the message so as to convey deeper meaning and understanding. This principle of communication is referred to as \_\_\_\_\_.
6. The use of non-verbal messages such as facial expressions, eye contact, body movement, gestures and physical contact to convey meaning are generally referred to as \_\_\_\_\_.
7. \_\_\_\_\_ is the study of ways that people use physical space to convey messages.
8. Communication can be classified on the basis of modes. The two modes of communication are \_\_\_\_\_ and \_\_\_\_\_.

9. Frederick Herzberg (1974) propounded the two-factor theory of motivation. These two factors are \_\_\_\_\_ and \_\_\_\_\_. Taking his theory into consideration, the inverse of the statement: "Adam is satisfied" is \_\_\_\_\_.

10. The researcher associated with the concept of *bounded rationality* is \_\_\_\_\_.

11. As a recommendation to his *theory*, Douglas McGregor (1960) encouraged the use of \_\_\_\_\_ in guiding management practice.

12. Raymond Cattell (1983) identified 171 traits and classified them under two broad categories, namely \_\_\_\_\_ and \_\_\_\_\_.

13. According to the Psychoanalytic theories of motivation, pioneered by Sigmund Freud (1917), superego is the moral branch of personality. The superego is also referred to as the \_\_\_\_\_ of humans.

14. The Social Learning theorist, Albert Bandura (1977), advanced that behavior is determined by, and modeled on observational learning from the environment. He then pointed out four stages of the modeling process, which are:

- i. \_\_\_\_\_
- ii. \_\_\_\_\_
- iii. \_\_\_\_\_
- iv. \_\_\_\_\_

15. Generally, there are three approaches to the study of motivation as related to organisations.

List these three approaches:

- i. \_\_\_\_\_
- ii. \_\_\_\_\_
- iii. \_\_\_\_\_

Index Number & Signature

16. David McClelland's (1955) Achievement Motivation theory is also known as the \_\_\_\_\_, and can be measured using a projective test called the \_\_\_\_\_.

17. According to the *Expectancy theory* of motivation, propounded by \_\_\_\_\_

Motivation = \_\_\_\_\_ x \_\_\_\_\_ x \_\_\_\_\_

18. The critical psychological state of *experienced meaningfulness of work* under the job characteristics model is determined by three core job dimensions, namely:

\_\_\_\_\_ and \_\_\_\_\_

19. Below are some statements associated with the personality of individuals. Write the appropriate personality type (using the Big Five Personality Factors) against each statement.

| Statement                                       | Personality Type (Big Five Factor) |
|---|------------------------------------|
| Example: I have a soft heart                    | Agreeableness                      |
| i. I really have time for others                |                                    |
| ii. I have excellent ideas                      |                                    |
| iii. I start conversations                      |                                    |
| iv. I pay attention to details                  |                                    |
| v. I worry a lot about things                   |                                    |
| vi. I have a very rich vocabulary               |                                    |
| vii. I don't mind being the center of attention |                                    |
| viii. I follow a schedule                       |                                    |
| ix. I change my mood a lot                      |                                    |
| x. I sympathise with others' feelings           |                                    |

## SECTION C

### CASE SCENARIOS

*Below are some case scenarios which relate to some aspects of human behavior in organisations. Read them carefully and then determine the terminology for each scenario. (9 marks)*

1. Mr. Von Akpa's subordinates have gradually developed a new attitude resulting from his own behavior towards them. Mr. Akpa is the Marketing Manager of Kalami Ltd., suppliers of Kalami Smartphones in the Greater Accra Region. Usually, his subordinates, or sales representatives, go out to supply products to customers. While doing so, they gather views from the customers on product quality and impressions from end-users. Whenever the sales representatives inform Mr. Akpa about negative comments from customers, he gets so upset and angry at everyone, simply because they are telling him what he does not want to hear. For this reason, the sales representatives hold on to the complaints of customers, and rather tell Mr. Akpa those few positive comments that excite him. Kalami Ltd. is not likely to survive the competition in the smartphone market.

It is clear from Mr. Von Akpa's attitude that he is exhibiting a barrier to effective communication known as \_\_\_\_\_.

2. The interview has been going on for the past ten (10) minutes. The radio show host simply wants to find out if indeed the Honourable Minister has allegedly received an amount of GH¢200,000.00 from J&Z Constructions as bribe before awarding the multi-million dollar project to the said construction company. However, the Minister is proving really difficult and would not give accurate responses. It is obvious that he feels threatened by the question, and his posture is actually hindering free communication, and so there is still no mutual understanding between the morning show host and the Honourable Minister.

The Honourable Minister's attitude is an example of a barrier to communication referred to as \_\_\_\_\_.

3. In order to cut down on the cost of buying a photocopier for each unit in Alikoto Savings and Loans Ltd., management has decided to buy one high-speed photocopier for use by all units. The machine was placed in a common room where all employers at the senior staff level had

unrestricted access. Enough A4 papers were also placed in the common room for the purposes of printing. One Friday evening, Mr. Atinka was caught red-handed with two boxes of A4 papers which he had 'stolen' from the photocopier room. The issue was referred to the disciplinary committee of Alikoto Savings and Loans Ltd. The disciplinary committee decided to restrict Mr. Atinka from ever going near the common room for the purpose of making photocopies.

The sanction placed on Mr. Atinka is an example of a reinforcement/punishment strategy known as \_\_\_\_\_.

4. When Ms. Josephine Adadi, Managing Director of Bandana Energy reported to office on Wednesday morning, she realized that the office premises was unusually quiet. She became a bit curious and wondered what the problem was. A few seconds later, she heard shouts of "gooooaaaal! ... goaaaal! ... goal!" She quickly headed towards the basement where she saw most of the workers shouting and jubilating. Ghana had just scored the winning goal against Papua New Guinea in the world cup finals being played in Australia. She got so furious and raised her voice at them: "Like seriously, what is the meaning of this? Is this a stadium or what? How can you be watching football during working hours when there is a lot to be done? In fact, before I open my eyes, I don't want to see anyone around here ... come on, get out ... everyone ... now!"

Ms. Adadi's reaction to the workers' behaviour is an example of a reinforcement/punishment strategy known as \_\_\_\_\_.

5. Irene is the new secretary attached to the office of the Chief Executive Officer (CEO) of Devacious and Sons Ltd. Working as the secretary to the CEO's office is indeed honourable and comes with a lot of opportunities. Irene however feels very uneasy whenever she sees her colleagues chatting together, and even feels worse when they laugh heartily during their conversations. Actually, she always feels that her friends are gossiping about her. "These people are enemies of progress; they are certainly plotting something evil against me ... jealous people!", she always murmurs to herself.

This irrational suspicion of Irene can best be described as: \_\_\_\_\_ personality disorder.

6. During the interview, Donald created the impression that he was capable and competent enough to perform his duties without close supervision. In fact, he convinced everyone on the panel that he was the best candidate. When Donald was eventually employed, he spent the first few days asking for assistance for every aspect of his work, which was thought to be normal. However, it's been five months and two weeks since Donald started working in his current position, but he still cannot do anything without relying on a fellow worker. "Hmmm, he is not as competent as he claimed to be ... he is actually becoming a nuisance ... when will he ever learn to do things on his own?!", sighed Ms. Esi Siaw, his immediate boss. Donald's behavior is a critical case of \_\_\_\_\_ personality disorder.

## **SECTION D**

### **SHORT ANSWER**

*Answer the question within the limits of the space provided on this question paper. (4 marks)*

1. Briefly explain the relationship between *Organisational Culture* and *Organisational Climate*.

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*All the best!*



**Section B: Answer all three questions in this section.**

**Question 1**

A company produces four types of products using two different manufacturing processes and two different materials. The following are the time (hours) spent by a product at each process and materials used (in lb) per unit of each product.

|            | Product 1 | Product 2 | Product 3 | Product 4 |
|------------|-----------|-----------|-----------|-----------|
| Process 1  | 4         | 4         | 5         | 4         |
| Process 2  | 2         | 3         | 4         | 2         |
| Material 1 | 15        | 18        | 18        | 25        |
| Material 2 | 8         | 13        | 10        | 11        |

The company has at its disposal, 1400 labour hours on *process 1*, and 1000 labour hours on *process 2*, 5400 lb of *material 1*, and 3200 lb of *material 2* per day.

Market demand requires that the combined number of product 1 and product 2 produced must exceed 60% of the combined number of all products produced.

A unit of product 1, 2, 3, and 4 sells for Ghs 60, Ghs 66, Ghs 55, and Ghs 76, but cost Ghs 10, Ghs 8, Ghs 9, and Ghs 16 to produce respectively.

- a. Provide a linear programming formulation to determine the optimal daily production plan to maximize the daily profit of the company. (10 marks)

The sensitivity report of the above LP problem solved using Excel Solver is as shown below.

#### Variable Cells

| Name      | Final Value | Reduced Cost | Objective Coefficient | Allowable Increase | Allowable Decrease |
|-----------|-------------|--------------|-----------------------|--------------------|--------------------|
| Product 1 | 300         | 0            | 50                    | 7.14               | 1.67               |
| Product 2 | 50          | 0            | 58                    | 2                  | 5                  |
| Product 3 | 0           | -14.50       | 46                    | 14.50              | 1E+30              |
| Product 4 | 0           | -16.67       | 60                    | 16.67              | 1E+30              |

#### Constraints

| Name               | Final Value | Shadow Price | Constraint R.H. Side | Allowable Increase | Allowable Decrease |
|--------------------|-------------|--------------|----------------------|--------------------|--------------------|
| Special Constraint | 140         | 0            | 0                    | 140                | 1E+30              |
| Process 1          | 1400        | 2.5          | 1400                 | 40                 | 35.29              |
| Process 2          | 750         | 0            | 1000                 | 1E+30              | 250                |
| Material 1         | 5400        | 2.67         | 5400                 | 90                 | 150                |
| Material 2         | 3050        | 0            | 3200                 | 1E+30              | 150                |

- b. What is the optimal daily production plan and the anticipated daily profit for the company?  
(3 marks)

- c. Suppose a customer were to ask the company to produce 20 of product 3.

i. what should be the minimum selling price the company must charge the customer given the information in the sensitivity report above? Explain. (3 marks)

ii. What will be the total profit forgone by the company if it decides to do it for the customer out of goodwill and of no additional charge? Explain. (3 marks)

d. If the unit profit of product 3 were to increase by Ghs 14, what will be the new optimal daily production plan, and what will be the impact on total profit? (3 marks)

e. Though all processes and materials are needed for production, at the moment which process and material is more important to the company and why? (3 marks)

### Question 2A

A Psychologist was interested in whether TV shows lead to a more positive outlook in human life. People were split into 4 groups and taken into a room to view a programme. The four groups saw the yolo show, BBC news, rhythms and the rundown. After the programme, a blood sample was taken and serotonin levels measured (more serotonin means more happy). The table below shows the results of serotonin levels for each group.

| The Yolo show                    | BBC News                         | Rhythms                         | The Rundown                      |
|----------------------------------|----------------------------------|---------------------------------|----------------------------------|
| 11                               | 4                                | 4                               | 7                                |
| 7                                | 8                                | 3                               | 7                                |
| 8                                | 6                                | 2                               | 5                                |
| 14                               | 11                               | 3                               | 4                                |
| 11                               | 9                                | 6                               | 9                                |
| 10                               | 8                                |                                 | 3                                |
| 5                                |                                  |                                 | 11                               |
|                                  |                                  |                                 | 3                                |
| $\bar{X}_{yolo} = 9.4286$        | $\bar{X}_{BBC} = 7.6667$         | $\bar{X}_{rhythms} = 3.6$       | $\bar{X}_{rundown} = 6.125$      |
| $\sum (x_i - \bar{x})^2 = 53.71$ | $\sum (x_i - \bar{x})^2 = 29.33$ | $\sum (x_i - \bar{x})^2 = 9.20$ | $\sum (x_i - \bar{x})^2 = 58.88$ |

From the table above assist the Psychologist to determine the level of differences in positive outlook in human life by answering the following questions.

- i. State the appropriate hypothesis test for the level of positive outlook in human life. (2 marks)
- ii. Test the hypothesis to identify the differences in level of outlook for the various groups. (10 marks). Assume  $F_{0.05,3,22} = 3.05$ .
- iii. What will be your recommendation to the Psychologist on the various programmes in human life? (2 marks)

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- iv. Using Fisher's LSD comparison approach, conduct a pairwise comparison test to determine if there exist significant differences in the pairs of Yolo show-BBC news and BBC-Rhythms. Conclude on your results. (6 marks)

#### Question 2B

A random sample of 100 Ghanaian companies taken in 2012 showed that, 21 companies offered high deductible health insurance plans to their workers. A separate random sample of 120 firms taken in 2013 showed that 30 offered high-deductible health insurance plans to their workers. Based on the sample results, construct a 95% confidence interval to estimate the difference in proportion for the respective years. (5 marks)

### Question 3

A consultant for the Ghanaian Ministry of Finance wanted to know the relationship between the growth in gross domestic product per capita (growth in GDP per capita) and external debt stock in order to advise the Minister of Finance regarding the level of Ghana's external debt and its implication on economic growth. The consultant assumed a simple linear regression model express as:

$$Y_t = \beta_0 + \beta_1 X_t + \varepsilon_t \quad (1)$$

Where  $Y_t$  is growth in GDP per capita,  $X_t$  is external debt stock as a ratio of gross national income,  $\beta_0$  and  $\beta_1$  are the intercept and slope parameters, respectively, while  $\varepsilon_t$  is the error term. The consultant estimated equation (1), using data on the two variables that covered the period 1990 to 2013. The results are reported in the ANOVA table below. Use the reported results to answer the questions below. Note that the values of the empty cells in the ANOVA table and that for the intercept term are to be calculated based on the information on the table.

ANOVA TABLE

|            | d.f. | SS      | MS     | F-ratio |
|------------|------|---------|--------|---------|
| Regression |      | 54.817  | 54.817 |         |
| Residual   |      |         |        |         |
| Total      |      | 149.383 |        |         |

|               | Coefficient | Standard Error | Lower 95% | Upper 95% | t-Stat | p-level  |
|---------------|-------------|----------------|-----------|-----------|--------|----------|
| Intercept     |             | 0.947          | 6.738     | 10.668    | 9.185  | 5.54E-09 |
| External debt | -0.044      | 0.012          | -0.069    | -0.018    | -3.571 | 0.001    |

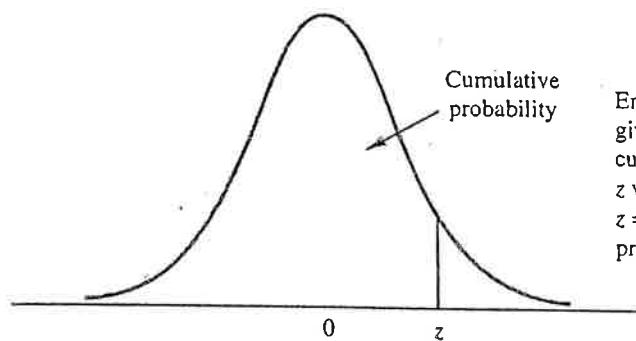
$$\bar{Y}_t = 5.6759; \quad \bar{X}_t = 68.4351; \quad \text{Sample size (N)} = 24$$

- a. Fill in the blank spaces in the ANOVA table including the value for the intercept. Show your work below. (6 marks)

- b. From the completed table, find the estimated regression equation relating  $Y_t$  and  $X_t$  (3 marks)

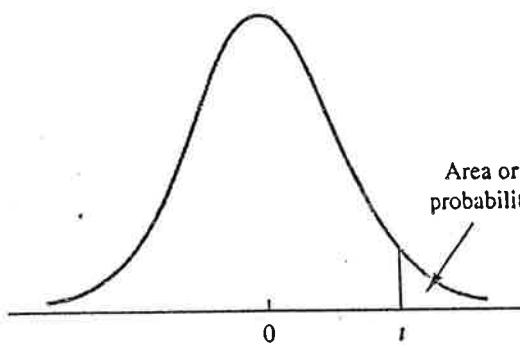
- c. Interpret the estimated intercept and slope coefficients and assess if each of the estimates is significant statistically at the 5% significance level. (6 marks)
- d. Predict the growth in GDP per capita in Ghana for each of the three different levels of external debt, 20, 50 and 70. Based on the predictions, which of the debt levels is less detrimental to Ghana's GDP per capita growth? (7 marks)
- e. Calculate the coefficient of determination based on results on the table above and interpret it (3 marks).

TABLE 1 CUMULATIVE PROBABILITIES FOR THE STANDARD NORMAL DISTRIBUTION (*Continued*)



Entries in the table give the area under the curve to the left of the  $z$  value. For example, for  $z = 1.25$ , the cumulative probability is .8944.

| $z$ | .00   | .01   | .02   | .03   | .04   | .05   | .06   | .07   | .08   | .09   |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| .0  | .5000 | .5040 | .5080 | .5120 | .5160 | .5199 | .5239 | .5279 | .5319 | .5359 |
| .1  | .5398 | .5438 | .5478 | .5517 | .5557 | .5596 | .5636 | .5675 | .5714 | .5753 |
| .2  | .5793 | .5832 | .5871 | .5910 | .5948 | .5987 | .6026 | .6064 | .6103 | .6141 |
| .3  | .6179 | .6217 | .6255 | .6293 | .6331 | .6368 | .6406 | .6443 | .6480 | .6517 |
| .4  | .6554 | .6591 | .6628 | .6664 | .6700 | .6736 | .6772 | .6808 | .6844 | .6879 |
| .5  | .6915 | .6950 | .6985 | .7019 | .7054 | .7088 | .7123 | .7157 | .7190 | .7224 |
| .6  | .7257 | .7291 | .7324 | .7357 | .7389 | .7422 | .7454 | .7486 | .7517 | .7549 |
| .7  | .7580 | .7611 | .7642 | .7673 | .7704 | .7734 | .7764 | .7794 | .7823 | .7852 |
| .8  | .7881 | .7910 | .7939 | .7967 | .7995 | .8023 | .8051 | .8078 | .8106 | .8133 |
| .9  | .8159 | .8186 | .8212 | .8238 | .8264 | .8289 | .8315 | .8340 | .8365 | .8389 |
| 1.0 | .8413 | .8438 | .8461 | .8485 | .8508 | .8531 | .8554 | .8577 | .8599 | .8621 |
| 1.1 | .8643 | .8665 | .8686 | .8708 | .8729 | .8749 | .8770 | .8790 | .8810 | .8830 |
| 1.2 | .8849 | .8869 | .8888 | .8907 | .8925 | .8944 | .8962 | .8980 | .8997 | .9015 |
| 1.3 | .9032 | .9049 | .9066 | .9082 | .9099 | .9115 | .9131 | .9147 | .9162 | .9177 |
| 1.4 | .9192 | .9207 | .9222 | .9236 | .9251 | .9265 | .9279 | .9292 | .9306 | .9319 |
| 1.5 | .9332 | .9345 | .9357 | .9370 | .9382 | .9394 | .9406 | .9418 | .9429 | .9441 |
| 1.6 | .9452 | .9463 | .9474 | .9484 | .9495 | .9505 | .9515 | .9525 | .9535 | .9545 |
| 1.7 | .9554 | .9564 | .9573 | .9582 | .9591 | .9599 | .9608 | .9616 | .9625 | .9633 |
| 1.8 | .9641 | .9649 | .9656 | .9664 | .9671 | .9678 | .9686 | .9693 | .9699 | .9706 |
| 1.9 | .9713 | .9719 | .9726 | .9732 | .9738 | .9744 | .9750 | .9756 | .9761 | .9767 |
| 2.0 | .9772 | .9778 | .9783 | .9788 | .9793 | .9798 | .9803 | .9808 | .9812 | .9817 |
| 2.1 | .9821 | .9826 | .9830 | .9834 | .9838 | .9842 | .9846 | .9850 | .9854 | .9857 |
| 2.2 | .9861 | .9864 | .9868 | .9871 | .9875 | .9878 | .9881 | .9884 | .9887 | .9890 |
| 2.3 | .9893 | .9896 | .9898 | .9901 | .9904 | .9906 | .9909 | .9911 | .9913 | .9916 |
| 2.4 | .9918 | .9920 | .9922 | .9925 | .9927 | .9929 | .9931 | .9932 | .9934 | .9936 |
| 2.5 | .9938 | .9940 | .9941 | .9943 | .9945 | .9946 | .9948 | .9949 | .9951 | .9952 |
| 2.6 | .9953 | .9955 | .9956 | .9957 | .9959 | .9960 | .9961 | .9962 | .9963 | .9964 |
| 2.7 | .9965 | .9966 | .9967 | .9968 | .9969 | .9970 | .9971 | .9972 | .9973 | .9974 |
| 2.8 | .9974 | .9975 | .9976 | .9977 | .9977 | .9978 | .9979 | .9979 | .9980 | .9981 |
| 2.9 | .9981 | .9982 | .9982 | .9983 | .9984 | .9984 | .9985 | .9985 | .9986 | .9986 |
| 3.0 | .9987 | .9987 | .9987 | .9988 | .9988 | .9989 | .9989 | .9989 | .9990 | .9990 |

TABLE 2  $t$  DISTRIBUTION

Entries in the table give  $t$  values for an area or probability in the upper tail of the  $t$  distribution. For example, with 10 degrees of freedom and a .05 area in the upper tail,  $t_{.05} = 1.812$ .

| Degrees of Freedom | Area in Upper Tail |       |       |        |        |        |
|--------------------|--------------------|-------|-------|--------|--------|--------|
|                    | .20                | .10   | .05   | .025   | .01    | .005   |
| 1                  | 1.376              | 3.078 | 6.314 | 12.706 | 31.821 | 63.656 |
| 2                  | 1.061              | 1.886 | 2.920 | 4.303  | 6.965  | 9.925  |
| 3                  | .978               | 1.638 | 2.353 | 3.182  | 4.541  | 5.841  |
| 4                  | .941               | 1.533 | 2.132 | 2.776  | 3.747  | 4.604  |
| 5                  | .920               | 1.476 | 2.015 | 2.571  | 3.365  | 4.032  |
| 6                  | .906               | 1.440 | 1.943 | 2.447  | 3.143  | 3.707  |
| 7                  | .896               | 1.415 | 1.895 | 2.365  | 2.998  | 3.499  |
| 8                  | .889               | 1.397 | 1.860 | 2.306  | 2.896  | 3.355  |
| 9                  | .883               | 1.383 | 1.833 | 2.262  | 2.821  | 3.250  |
| 10                 | .879               | 1.372 | 1.812 | 2.228  | 2.764  | 3.169  |
| 11                 | .876               | 1.363 | 1.796 | 2.201  | 2.718  | 3.106  |
| 12                 | .873               | 1.356 | 1.782 | 2.179  | 2.681  | 3.055  |
| 13                 | .870               | 1.350 | 1.771 | 2.160  | 2.650  | 3.012  |
| 14                 | .868               | 1.345 | 1.761 | 2.145  | 2.624  | 2.977  |
| 15                 | .866               | 1.341 | 1.753 | 2.131  | 2.602  | 2.947  |
| 16                 | .865               | 1.337 | 1.746 | 2.120  | 2.583  | 2.921  |
| 17                 | .863               | 1.333 | 1.740 | 2.110  | 2.567  | 2.898  |
| 18                 | .862               | 1.330 | 1.734 | 2.101  | 2.552  | 2.878  |
| 19                 | .861               | 1.328 | 1.729 | 2.093  | 2.539  | 2.861  |
| 20                 | .860               | 1.325 | 1.725 | 2.086  | 2.528  | 2.845  |
| 21                 | .859               | 1.323 | 1.721 | 2.080  | 2.518  | 2.831  |
| 22                 | .858               | 1.321 | 1.717 | 2.074  | 2.508  | 2.819  |
| 23                 | .858               | 1.319 | 1.714 | 2.069  | 2.500  | 2.807  |
| 24                 | .857               | 1.318 | 1.711 | 2.064  | 2.492  | 2.797  |
| 25                 | .856               | 1.316 | 1.708 | 2.060  | 2.485  | 2.787  |
| 26                 | .856               | 1.315 | 1.706 | 2.056  | 2.479  | 2.779  |
| 27                 | .855               | 1.314 | 1.703 | 2.052  | 2.473  | 2.771  |
| 28                 | .855               | 1.313 | 1.701 | 2.048  | 2.467  | 2.763  |
| 29                 | .854               | 1.311 | 1.699 | 2.045  | 2.462  | 2.756  |
| 30                 | .854               | 1.310 | 1.697 | 2.042  | 2.457  | 2.750  |
| 31                 | .853               | 1.309 | 1.696 | 2.040  | 2.453  | 2.744  |
| 32                 | .853               | 1.309 | 1.694 | 2.037  | 2.449  | 2.738  |
| 33                 | .853               | 1.308 | 1.692 | 2.035  | 2.445  | 2.733  |
| 34                 | .852               | 1.307 | 1.691 | 2.032  | 2.441  | 2.728  |

### Formula Sheet

$$P(x) = \frac{n!}{x!(n-x)!} P^x (1-p)^{n-x}$$

$$P(x) = \frac{\mu^x e^{-\mu}}{x!}$$

$$P(x) = \frac{C_{n-x}^{N-x} * C_x^x}{C_n^N}$$

**Normal and sampling distribution**

$$Z = \frac{X-\mu}{\sigma}$$

$$P(a \leq z \leq b) = P(z \leq b) - P(z \leq a)$$

$$Z = \frac{\bar{x}-\mu}{\frac{\sigma}{\sqrt{n}}}$$

$$CI = \bar{x} \pm t_{\alpha/2} * s / \sqrt{n}$$

When  $\sigma_1$  and  $\sigma_2$  are known

$$\sigma_{\bar{x}_1 - \bar{x}_2} = \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$$

$$\bar{x}_1 - \bar{x}_2 \pm z_{\alpha/2} \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$$

$$Z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

When  $\sigma_1$  and  $\sigma_2$  are unknown

$$(\bar{x}_1 - \bar{x}_2) \pm t_{\alpha/2} \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$$

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$df = \frac{\left( \frac{s_1^2}{n_1} + \frac{s_2^2}{n_2} \right)^2}{\frac{1}{n_1-1} \left( \frac{s_1^2}{n_1} \right)^2 + \frac{1}{n_2-1} \left( \frac{s_2^2}{n_2} \right)^2}$$

When  $\sigma_1$  and  $\sigma_2$  are unknown but the two variances are assumed equal (i.e.  $\sigma_1 = \sigma_2 = \sigma$ )

$$s_p^2 = \frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}$$

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

**One-Way-Anova**

$$SST = \sum_{i=1}^k \sum_{j=1}^{n_i} (x_{ij} - \bar{x})^2 ; \quad SSB = \sum_{i=1}^k n_i (\bar{x}_i - \bar{x})^2 ; \quad SSW = \sum_{i=1}^k \sum_{j=1}^{n_i} (x_{ij} - \bar{x}_i)^2$$

$$F = \frac{MSB}{MSW} ;$$

$$\text{Fisher's LSD critical range} = t_{\alpha/2} \sqrt{MSE \left( \frac{1}{n_i} + \frac{1}{n_j} \right)}$$

**Simple Linear Regression**

$$b_1 = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sum_{i=1}^n (x_i - \bar{x})^2} ;$$

$$b_0 = \bar{y} - b_1 \bar{x}$$

$$S_{b_1} = \frac{s_\varepsilon}{\sum_{i=1}^n (x_i - \bar{x})^2}$$

$$s_\varepsilon = \sqrt{\frac{SSE}{n-2}}$$

$$\hat{y} = b_0 + b_1 x$$

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UNIVERSITY OF GHANA

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END OF FIRST SEMESTER EXAMINATIONS: 2015/2016

UGBS 301: QUANTITATIVE METHODS (3 credits)

THREE (3) HOURS

**INSTRUCTIONS:** Answer ALL questions from both section A and section B. All questions must be answered on the question sheet. Carefully plan your answers to fit the spaces provided. Relevant formulae and tables are provided. No credit will be given for an answer with no work shown.

**Section A (25 marks):** This section contains 10 multiple choice questions. Show your work in the space provided and circle the correct answer. Each question carries 2.5 marks.

1. Linear programming theory states that the optimal solution to any problem will lie at  
A. the origin    B. a corner point of the feasible region    C. the highest point of the feasible region  
D. the lowest point in the feasible region    E. none of the above

2. Consider the following linear programming problem:

$$\begin{array}{ll} \text{Max} & Z = 14x + 18y \\ \text{Subject to} & 8x + 6y \leq 960 \\ & 4x + 6y \leq 720 \\ & x \geq 0, y \geq 0 \end{array}$$

Which of the following points (x,y) are feasible?

- |                   |                |               |             |            |               |
|-------------------|----------------|---------------|-------------|------------|---------------|
| i. (80,60)        | ii. (110,15)   | iii. (30,100) | iv. (60,90) | v. (60,80) |               |
| a. i, ii, iii, iv | b. ii, iii, iv | c. ii, iii, v | d. iii, v   | e. i, v    | f. iii, iv, v |

3. The shadow price is calculated to be 3 for a less than or equal to constraint in a maximization LP problem, this means:  
A. if the RHS for that constraint is increased by 3 then the optimal objective function value is increase by 1  
B. if the RHS for that constraint is increased by 1 then the optimal objective function value will increase by 3  
C. if the coefficient of the objective function is increase by 1 then the RHS for that constraint must be increased by 3.  
D. if the coefficient of the objective function is increase by 3 then the RHS for that constraint must be increased by 1.

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4. A binding constraint;

- i. means that all the resources for that constraint are used.
- ii. the slack for that constraint is zero.
- iii. has a non-zero shadow price.
- iv. has a zero shadow price.

A. i, ii, iii only    B. i,ii,iv only    C. i,ii only    D. i,iv only    E. ii,iii only

5. Which of the following is not a discrete probability distribution?

A. Binomial    B. Poisson    C. Normal    D. Exponential

6. The graduate unemployment rate in Ghana is 35%. Assume 20 graduates in Ghana are randomly selected. What is the probability that all of the selected graduates are employed?

A. 0.00218    B. 0.982    C. 0.25    D. 0.00018    E. 0.641

7. Patients arrive at the emergency room of UG Hospital at the average rate of 10 per hour on weekend evenings. What is the probability of 5 arrivals in 30 minutes on a weekend evening?

A. 0.125    B. 0.018    C. 0.250    D. 0.038    E. 0.175

8. Assume that a random variable is normally distributed with a mean of 200 and a standard deviation of 16. What is the probability that a randomly selected value will be less than 220?

A. 0.1056    B. 0.8944    C. 0.5319    D. 0.9220    E. 0.641



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9. Assume  $n$  is sample size. Which of the following is/are generally true in statistical inference?
- i. If a population is normal with mean  $\mu$  and standard deviation  $\sigma$ , the distribution of the sample means ( $\bar{x}$ ) is also normally distributed with  $\mu_{\bar{x}} = \mu$  and  $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$ .
  - ii. Even if the population is not normal, sample means from the population will be approximately normal as long as the sample size is large enough, and the sampling distribution will have  $\mu_{\bar{x}} = \mu$  and  $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$ .
  - iii. For most distributions,  $n > 30$  will give a sampling distribution that is nearly normal.
  - iv. Normality must be ensured when constructing confidence intervals.
- A. i,ii,iii only    B. i,ii,iv only    C. i, iii only    D. All of the above    E. None of the above

10. A Type I error in hypothesis testing is the error committed when:

- A. a false null hypothesis is accepted.
- B. a true null hypothesis is rejected.
- C. one fails to reject a false null hypothesis.
- D. a false null hypothesis is rejected.

**Section B: Answer all four questions in this section.**

1. The Volta River Authority (VRA) has scheduled the construction of new thermal plants five, ten, and twenty years from now to meet the needs of the country's growing population. To finance the construction of these plants, VRA needs to invest some of the company's money now to meet these future cash-flow needs. VRA may invest in only three kinds of financial assets, each of which costs \$1 million per unit. Fractional units may be purchased. The assets will yield income five, ten, and twenty years from now, and that income is needed to cover at least the minimum cash-flow requirements in those years. (Any excess income above the minimum requirement for each time period will be used to increase dividend payments to shareholders rather than saving it to help meet the minimum cash-flow requirement in the next time period.)

The following table shows both the amount of income generated by each unit of each asset and the minimum amount of income needed for each of the future time periods when a new thermal plant will be constructed.

| Year   | Income per Unit of Asset |               |               | Minimum Cash Flow Required |
|--------|--------------------------|---------------|---------------|----------------------------|
|        | Asset 1                  | Asset 2       | Asset 3       |                            |
| five   | \$2 million              | \$1 million   | \$0.5 million | 400 million                |
| ten    | \$0.5 million            | \$0.5 million | \$1 million   | \$100 million              |
| twenty | 0                        | \$1.5 million | \$2 million   | \$300 million              |

VRA wishes to determine the mix of investments in these assets that will cover the cash-flow requirements while minimizing the total amount invested.

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(a) Formulate a linear programming model for this problem (7 marks).

(b) Suppose VRA plans to purchase a mix of 100 units of Asset 1, 100 units of Asset 2, and 80 units of Asset 3.

i. How much cash flow would this mix of investments generate five, ten, and twenty years from now and what would be the total amount invested? (4 marks)

Year 5 Cash flow =

Year 10 Cash flow =

Year 20 Cash flow =

Total cost =

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ii. Is this purchasing plan feasible? Explain. (3 marks)

Below is a portion of the sensitivity report for VRA's investment problem.

**Variable Cells (values are in \$millions)**

| Name    | Final Value | Reduced Cost | Objective Coefficient | Allowable Increase | Allowable Decrease |
|---------|-------------|--------------|-----------------------|--------------------|--------------------|
| Asset 1 | 100         | \$0          | 1                     | 1                  | 0.2                |
| Asset 2 | 200         | \$0          | 1                     | 0.0625             | 0.5                |
| Asset 3 | 0           | 0.083333     | 1                     | 1E+30              | 0.0833333          |

**Constraints (values are in \$million)**

| Name    | Final Value | Shadow Price | Constraint R.H. Side | Allowable Increase | Allowable Decrease |
|---------|-------------|--------------|----------------------|--------------------|--------------------|
| Year 5  | 400         | 0.5          | 400                  | 1E+30              | 200                |
| Year 10 | 150         | 0            | 100                  | 50                 | 1E+30              |
| Year 20 | 300         | 0.333333     | 300                  | 300                | 300                |

c. What are the optimal units of Asset 1, Asset 2 and Asset 3 to purchase in order to realize the stated objective of VRA (3 marks)

Asset 1 =

Asset 2 =

Asset 3 =

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- d. Given the reported optimal units of Asset 1, Asset 2 and Asset 3 to purchase in order to realize the stated objective of VRA, what would be the respective cash flows realized in year five, ten and twenty? (3 marks)

Year 5 Cash flow =

Year 10 Cash flow =

Year 20 Cash flow =

- e. Suppose the cost per unit of Asset 1 changes to \$950,000. Will the optimal purchased units change, and what will be the effect on total cost of the three assets? (3 marks)

- f. How would you explain the reduced cost of Asset 3 in relation to the final value of zero for Asset 3? (2 marks)

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2. The Quality Assurance Division of University of Ghana is concerned that there seem to be significant differences in the performance of Main Campus, City Campus, and Distance Education students. The table below contains data on the average GPA of graduating students in some randomly selected years.

| Year  | GPA  |      |          |
|-------|------|------|----------|
|       | Main | City | Distance |
| 1     | 2.5  | 2.2  | 1.9      |
| 2     | 2.4  | 2.5  | 2.0      |
| 3     | 2.6  | 2.4  | 1.8      |
| 4     | 2.4  | 2.4  | 2.4      |
| 5     | 2.4  | 2.0  | 1.9      |
| 6     | 2.8  | 1.9  | 2.0      |
| 7     | 2.2  | 2.3  | 1.8      |
| 8     | 2.3  | 2.2  | 2.2      |
| 9     | 2.4  |      |          |
| 10    | 2.6  |      |          |
| Total | 24.6 | 17.9 | 16       |

Table 3: GPA of Main, City and Distance Education students in 10 randomly selected years.

Let  $u_1$ ,  $u_2$ , and  $u_3$  be the population mean GPA of Main, City and Distance education students respectively. The following are important summary from the GPA table above.

Total Sum of Squares ( $SST$ ) = 1.805

Sample means for Main, City, and Distance campuses are respectively,  $\bar{x}_1 = 2.46$ ,  $\bar{x}_2 = 2.24$ ,  $\bar{x}_3 = 2.00$ .

Grand Mean for the three campuses is  $\bar{x} = 2.25$ .

a. (4 marks) State the appropriate hypothesis test for the GPA performance study.

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- b. (8 marks) Fill in the Anova table for the GPA Performance study below. Show your work in the space provided. Assume  $\alpha = 0.05$

ANOVA

| Source of Variation | SS | df | MS | F | P-value | F crit |
|---------------------|----|----|----|---|---------|--------|
| Between Groups      |    |    |    |   | 0.0002  |        |
| Within Groups       |    |    |    |   |         |        |
| Total               |    |    |    |   |         |        |

- c. (3 marks) From the calculation in the table above, test whether there is sufficient evidence to reject the null hypothesis at the  $\alpha=0.05$  level of significance. Show your work.

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d. (7 marks) Using Tukey-Kramer's comparison approach, conduct a pair-wise comparison test to see if there exist significant difference between the pairs of Main-Distance, and City-Distance. Use  $\alpha=0.05$ . Test using a  $q_\alpha = 3.07$ .

e. (3 marks) Assume there is no significant difference in student GPA between Main and City campus. As the head of the Quality Assurance division, and based on the results from the ANOVA table in addition to your answers to question c and d above, summarize the findings from your study to the Vice Chancellor including your recommendations.

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3. The government of Ghana believes annual domestic tax revenue is correlated or could be explained by annual electricity demand. The following table contains data on electricity demand and domestic tax revenue for the last 10 years.

| Year  | Electricity Demand (GWh)<br>(x) | Tax Revenue (Ghc Billions)<br>(y) |
|-------|---------------------------------|-----------------------------------|
| 2003  | 6800                            | 1.22                              |
| 2004  | 6900                            | 1.74                              |
| 2005  | 7500                            | 2.10                              |
| 2006  | 9500                            | 2.40                              |
| 2007  | 7500                            | 3.20                              |
| 2008  | 8500                            | 4.20                              |
| 2009  | 9000                            | 4.60                              |
| 2010  | 10500                           | 6.20                              |
| 2011  | 11500                           | 8.90                              |
| 2012  | 12200                           | 11.40                             |
| Total | 89900                           | 45.96                             |

Useful data about the table above:

$$\sum_{t=1}^n (x_t - \bar{x})(y_t - \bar{y}) = 53301.6$$

$$\sum_{t=1}^n (x_t - \bar{x})^2 = 32989000$$

$$\sum_{t=1}^n (y_t - \bar{y})^2 = 100.1$$

a. (3 marks) Calculate the correlation coefficient for X and Y and interpret the result.

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b. (8 marks) Using least squares method, calculate  $b_0$  and  $b_1$  to develop an estimated regression equation model for the relationship between annual domestic tax revenue and annual electricity demand. Where  $b_0$  is the y intercept of the estimated regression line, and  $b_1$  is the slope of the estimated regression line.

c. (2 marks) What does  $b_1$  imply in this problem?

d. (2 marks) Use the estimated regression equation to predict the average annual domestic tax for an electricity demand of 14,000 GWh in the year 2013. 2 marks

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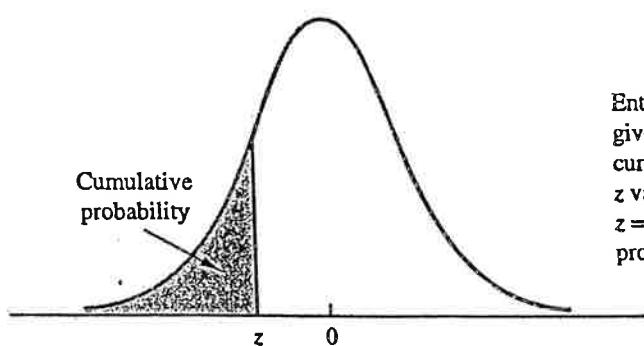
e. (3 marks) What is the coefficient of determination,  $r^2$  assuming Sum of Squares Error ( $SSR$ ) = 86.12?

f. (2 marks) What does the  $R^2$  value mean?

g. (2 marks) Do you think the regression model is a good fit for the data if the desired coefficient of determination is at least 80% for the model to be a good fit? Explain.

h. (3 marks) What advice would you give to the government of Ghana based on the findings from the regression?

TABLE 1 CUMULATIVE PROBABILITIES FOR THE STANDARD NORMAL DISTRIBUTION



Entries in the table give the area under the curve to the left of the  $z$  value. For example, for  $z = -.85$ , the cumulative probability is .1977.

| $z$  | .00   | .01   | .02   | .03   | .04   | .05   | .06   | .07   | .08   | .09   |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| -3.0 | .0013 | .0013 | .0013 | .0012 | .0012 | .0011 | .0011 | .0011 | .0010 | .0010 |
| -2.9 | .0019 | .0018 | .0018 | .0017 | .0016 | .0016 | .0015 | .0015 | .0014 | .0014 |
| -2.8 | .0026 | .0025 | .0024 | .0023 | .0023 | .0022 | .0021 | .0021 | .0020 | .0019 |
| -2.7 | .0035 | .0034 | .0033 | .0032 | .0031 | .0030 | .0029 | .0028 | .0027 | .0026 |
| -2.6 | .0047 | .0045 | .0044 | .0043 | .0041 | .0040 | .0039 | .0038 | .0037 | .0036 |
| -2.5 | .0062 | .0060 | .0059 | .0057 | .0055 | .0054 | .0052 | .0051 | .0049 | .0048 |
| -2.4 | .0082 | .0080 | .0078 | .0075 | .0073 | .0071 | .0069 | .0068 | .0066 | .0064 |
| -2.3 | .0107 | .0104 | .0102 | .0099 | .0096 | .0094 | .0091 | .0089 | .0087 | .0084 |
| -2.2 | .0139 | .0136 | .0132 | .0129 | .0125 | .0122 | .0119 | .0116 | .0113 | .0110 |
| -2.1 | .0179 | .0174 | .0170 | .0166 | .0162 | .0158 | .0154 | .0150 | .0146 | .0143 |
| -2.0 | .0228 | .0222 | .0217 | .0212 | .0207 | .0202 | .0197 | .0192 | .0188 | .0183 |
| -1.9 | .0287 | .0281 | .0274 | .0268 | .0262 | .0256 | .0250 | .0244 | .0239 | .0233 |
| -1.8 | .0359 | .0351 | .0344 | .0336 | .0329 | .0322 | .0314 | .0307 | .0301 | .0294 |
| -1.7 | .0446 | .0436 | .0427 | .0418 | .0409 | .0401 | .0392 | .0384 | .0375 | .0367 |
| -1.6 | .0548 | .0537 | .0526 | .0516 | .0505 | .0495 | .0485 | .0475 | .0465 | .0455 |
| -1.5 | .0668 | .0655 | .0643 | .0630 | .0618 | .0606 | .0594 | .0582 | .0571 | .0559 |
| -1.4 | .0808 | .0793 | .0778 | .0764 | .0749 | .0735 | .0721 | .0708 | .0694 | .0681 |
| -1.3 | .0968 | .0951 | .0934 | .0918 | .0901 | .0885 | .0869 | .0853 | .0838 | .0823 |
| -1.2 | .1151 | .1131 | .1112 | .1093 | .1075 | .1056 | .1038 | .1020 | .1003 | .0985 |
| -1.1 | .1357 | .1335 | .1314 | .1292 | .1271 | .1251 | .1230 | .1210 | .1190 | .1170 |
| -1.0 | .1587 | .1562 | .1539 | .1515 | .1492 | .1469 | .1446 | .1423 | .1401 | .1379 |
| -.9  | .1841 | .1814 | .1788 | .1762 | .1736 | .1711 | .1685 | .1660 | .1635 | .1611 |
| -.8  | .2119 | .2090 | .2061 | .2033 | .2005 | .1977 | .1949 | .1922 | .1894 | .1867 |
| -.7  | .2420 | .2389 | .2358 | .2327 | .2296 | .2266 | .2236 | .2206 | .2177 | .2148 |
| -.6  | .2743 | .2709 | .2676 | .2643 | .2611 | .2578 | .2546 | .2514 | .2483 | .2451 |
| -.5  | .3085 | .3050 | .3015 | .2981 | .2946 | .2912 | .2877 | .2843 | .2810 | .2776 |
| -.4  | .3446 | .3409 | .3372 | .3336 | .3300 | .3264 | .3228 | .3192 | .3156 | .3121 |
| -.3  | .3821 | .3783 | .3745 | .3707 | .3669 | .3632 | .3594 | .3557 | .3520 | .3483 |
| -.2  | .4207 | .4168 | .4129 | .4090 | .4052 | .4013 | .3974 | .3936 | .3897 | .3859 |
| -.1  | .4602 | .4562 | .4522 | .4483 | .4443 | .4404 | .4364 | .4325 | .4286 | .4247 |
| -.0  | .5000 | .4960 | .4920 | .4880 | .4840 | .4801 | .4761 | .4721 | .4681 | .4641 |

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$$P(x) = \frac{n!}{x!(n-x)!} P^x (1-p)^{n-x} \quad P(x) = \frac{\mu^x e^{-\mu}}{x!} \quad P(x) = \frac{C_{n-x}^{N-x} C_x^x}{C_n^N}$$

### Normal and sampling distribution

$$Z = \frac{\bar{x} - \mu}{\sigma} \quad P(a \leq z \leq b) = P(z \leq b) - P(z \leq a) \quad Z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}}$$

$$CI = \bar{x} \pm t_{\alpha/2} * s / \sqrt{n}$$

When  $\sigma_1$  and  $\sigma_2$  are known

$$\sigma_{\bar{x}_1 - \bar{x}_2} = \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}} \quad \bar{x}_1 - \bar{x}_2 \pm z_{\alpha/2} \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}} \quad Z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

When  $\sigma_1$  and  $\sigma_2$  are unknown

$$(\bar{x}_1 - \bar{x}_2) \pm t_{\alpha/2} \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}} \quad t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \\ df = \frac{\left( \frac{s_1^2}{n_1} + \frac{s_2^2}{n_2} \right)^2}{\frac{1}{n_1 - 1} \left( \frac{s_1^2}{n_1} \right)^2 + \frac{1}{n_2 - 1} \left( \frac{s_2^2}{n_2} \right)^2}$$

When  $\sigma_1$  and  $\sigma_2$  are unknown but the two variances are assumed equal (i.e.  $\sigma_1 = \sigma_2 = \sigma$ )

$$s_p^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$$

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

### One-Way-Anova

$$SST = \sum_{l=1}^k \sum_{j=1}^{n_l} (x_{lj} - \bar{x})^2 ; \quad SSB = \sum_{l=1}^k n_l (\bar{x}_l - \bar{x})^2 ; \quad SSW = \sum_{l=1}^k \sum_{j=1}^{n_l} (x_{lj} - \bar{x}_l)^2$$

$$F = \frac{MSB}{MSW} ; \quad \text{Tukey-Cramer critical range} = q_\alpha \sqrt{\frac{MSE}{2} \left( \frac{1}{n_l} + \frac{1}{n_j} \right)}$$

### Simple Linear Regression

$$r = \frac{\frac{\sum_{l=1}^n (x_l - \bar{x})(y_l - \bar{y})}{n-1}}{\sqrt{\frac{\sum_{l=1}^n (x_l - \bar{x})^2}{n-1}} \cdot \sqrt{\frac{\sum_{l=1}^n (y_l - \bar{y})^2}{n-1}}} ; \quad b_1 = \frac{\sum_{l=1}^n (x_l - \bar{x})(y_l - \bar{y})}{\sum_{l=1}^n (x_l - \bar{x})^2} ; \quad b_0 = \bar{y} - b_1 \bar{x}$$

$$s_{b_1} = \frac{s_\epsilon}{\sum_{l=1}^n (x_l - \bar{x})^2} \quad s_\epsilon = \sqrt{\frac{SSE}{n-2}} \quad \hat{y} = b_0 + b_1 x$$

| Denominator Degrees of Freedom | Area in Upper Tail | Numerator Degrees of Freedom |      |      |      |      |      |      |      |      |      |
|--------------------------------|--------------------|------------------------------|------|------|------|------|------|------|------|------|------|
|                                |                    | 1                            | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   |
| 16                             | .10                | 3.05                         | 2.67 | 2.46 | 2.33 | 2.24 | 2.18 | 2.13 | 2.09 | 2.06 | 2.03 |
|                                | .05                | 4.49                         | 3.63 | 3.24 | 2.85 | 2.74 | 2.66 | 2.59 | 2.54 | 2.49 | 2.35 |
|                                | .025               | 6.12                         | 4.69 | 4.08 | 3.73 | 3.50 | 3.34 | 3.22 | 3.12 | 3.05 | 2.99 |
|                                | .01                | 8.53                         | 6.23 | 5.29 | 4.77 | 4.44 | 4.20 | 4.03 | 3.89 | 3.78 | 3.69 |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
| 17                             | .10                | 3.03                         | 2.64 | 2.44 | 2.31 | 2.22 | 2.15 | 2.10 | 2.06 | 2.03 | 2.00 |
|                                | .05                | 4.45                         | 3.59 | 3.20 | 2.96 | 2.81 | 2.70 | 2.61 | 2.55 | 2.49 | 2.45 |
|                                | .025               | 6.04                         | 4.62 | 4.01 | 3.66 | 3.44 | 3.28 | 3.16 | 3.06 | 2.98 | 2.92 |
|                                | .01                | 8.40                         | 6.11 | 5.19 | 4.67 | 4.34 | 4.10 | 3.93 | 3.79 | 3.68 | 3.59 |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
| 18                             | .10                | 3.01                         | 2.62 | 2.42 | 2.29 | 2.20 | 2.13 | 2.08 | 2.04 | 2.00 | 1.98 |
|                                | .05                | 4.41                         | 3.55 | 3.16 | 2.93 | 2.77 | 2.66 | 2.58 | 2.51 | 2.46 | 2.41 |
|                                | .025               | 5.98                         | 4.56 | 4.01 | 3.95 | 3.61 | 3.38 | 3.22 | 3.10 | 3.01 | 2.93 |
|                                | .01                | 8.29                         | 6.01 | 5.09 | 4.58 | 4.25 | 4.01 | 3.84 | 3.71 | 3.60 | 3.51 |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
| 19                             | .10                | 2.99                         | 2.61 | 2.40 | 2.27 | 2.18 | 2.11 | 2.06 | 2.02 | 1.98 | 1.94 |
|                                | .05                | 4.38                         | 3.52 | 3.13 | 2.90 | 2.74 | 2.63 | 2.54 | 2.48 | 2.42 | 2.37 |
|                                | .025               | 5.92                         | 4.51 | 4.00 | 3.90 | 3.56 | 3.33 | 3.17 | 3.05 | 2.96 | 2.87 |
|                                | .01                | 8.18                         | 5.93 | 5.01 | 4.50 | 4.17 | 3.94 | 3.77 | 3.63 | 3.52 | 3.43 |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
| 20                             | .10                | 2.97                         | 2.59 | 2.38 | 2.25 | 2.16 | 2.09 | 2.04 | 2.00 | 1.96 | 1.92 |
|                                | .05                | 4.35                         | 3.49 | 3.10 | 2.87 | 2.71 | 2.60 | 2.51 | 2.45 | 2.42 | 2.38 |
|                                | .025               | 5.87                         | 4.46 | 4.06 | 3.86 | 3.51 | 3.29 | 3.13 | 3.01 | 2.91 | 2.84 |
|                                | .01                | 8.10                         | 5.85 | 5.01 | 4.43 | 4.10 | 3.87 | 3.70 | 3.56 | 3.46 | 3.37 |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
| 21                             | .10                | 2.96                         | 2.57 | 2.36 | 2.23 | 2.14 | 2.08 | 2.02 | 1.98 | 1.95 | 1.92 |
|                                | .05                | 4.32                         | 3.47 | 3.07 | 2.84 | 2.68 | 2.57 | 2.49 | 2.42 | 2.37 | 2.32 |
|                                | .025               | 5.83                         | 4.42 | 4.02 | 3.82 | 3.48 | 3.25 | 3.09 | 2.97 | 2.84 | 2.77 |
|                                | .01                | 8.02                         | 5.78 | 5.02 | 4.37 | 4.04 | 3.81 | 3.64 | 3.51 | 3.40 | 3.31 |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
| 22                             | .10                | 2.95                         | 2.56 | 2.35 | 2.22 | 2.13 | 2.06 | 2.01 | 1.97 | 1.93 | 1.90 |
|                                | .05                | 4.30                         | 3.44 | 3.05 | 2.82 | 2.66 | 2.55 | 2.46 | 2.40 | 2.34 | 2.30 |
|                                | .025               | 5.79                         | 4.38 | 4.00 | 3.78 | 3.44 | 3.22 | 3.05 | 2.93 | 2.80 | 2.70 |
|                                | .01                | 7.95                         | 5.72 | 5.02 | 4.82 | 4.31 | 3.99 | 3.76 | 3.59 | 3.45 | 3.35 |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
| 23                             | .10                | 2.94                         | 2.55 | 2.34 | 2.21 | 2.11 | 2.05 | 1.99 | 1.95 | 1.92 | 1.89 |
|                                | .05                | 4.28                         | 3.42 | 3.03 | 2.80 | 2.64 | 2.53 | 2.44 | 2.40 | 2.34 | 2.30 |
|                                | .025               | 5.75                         | 4.35 | 4.01 | 3.75 | 3.41 | 3.18 | 3.02 | 2.90 | 2.81 | 2.73 |
|                                | .01                | 7.88                         | 5.66 | 5.01 | 4.76 | 4.26 | 3.94 | 3.71 | 3.54 | 3.41 | 3.30 |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
| 24                             | .10                | 2.93                         | 2.54 | 2.33 | 2.21 | 2.10 | 2.04 | 1.98 | 1.94 | 1.91 | 1.88 |
|                                | .05                | 4.26                         | 3.40 | 3.01 | 2.78 | 2.62 | 2.51 | 2.42 | 2.36 | 2.30 | 2.25 |
|                                | .025               | 5.72                         | 4.32 | 4.01 | 3.72 | 3.38 | 3.15 | 3.09 | 2.87 | 2.78 | 2.70 |
|                                | .01                | 7.82                         | 5.61 | 5.01 | 4.72 | 4.22 | 3.90 | 3.67 | 3.50 | 3.36 | 3.26 |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |
|                                |                    |                              |      |      |      |      |      |      |      |      |      |





37. Chairman Damian gave an excellent speech; however, his concluding statement of "all die be die" got everyone worried and afraid because of the likely consequences. The Deputy Chairman is convinced that if no statement is issued as early as possible to clear the air, there would be 'bad' publicity the following morning in the media, and so a very smart person is needed to appeal to the conscience of the public, that Chairman Damian did not mean any harm by what he said. Nana Ama, a very diplomatic lady, has been asked to make a press release within the next hour.

As far as this scenario is concerned, how would you describe Nana Ama?

38. Explain the following terms: (2 marks each)

a. Delayering:

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b. Rightsizing:

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39. Briefly explain the following statement, using the *reinforcement theory* of motivation: "A manager who wants to change an employee's behavior must change the specific consequences of that behavior". (3 marks)

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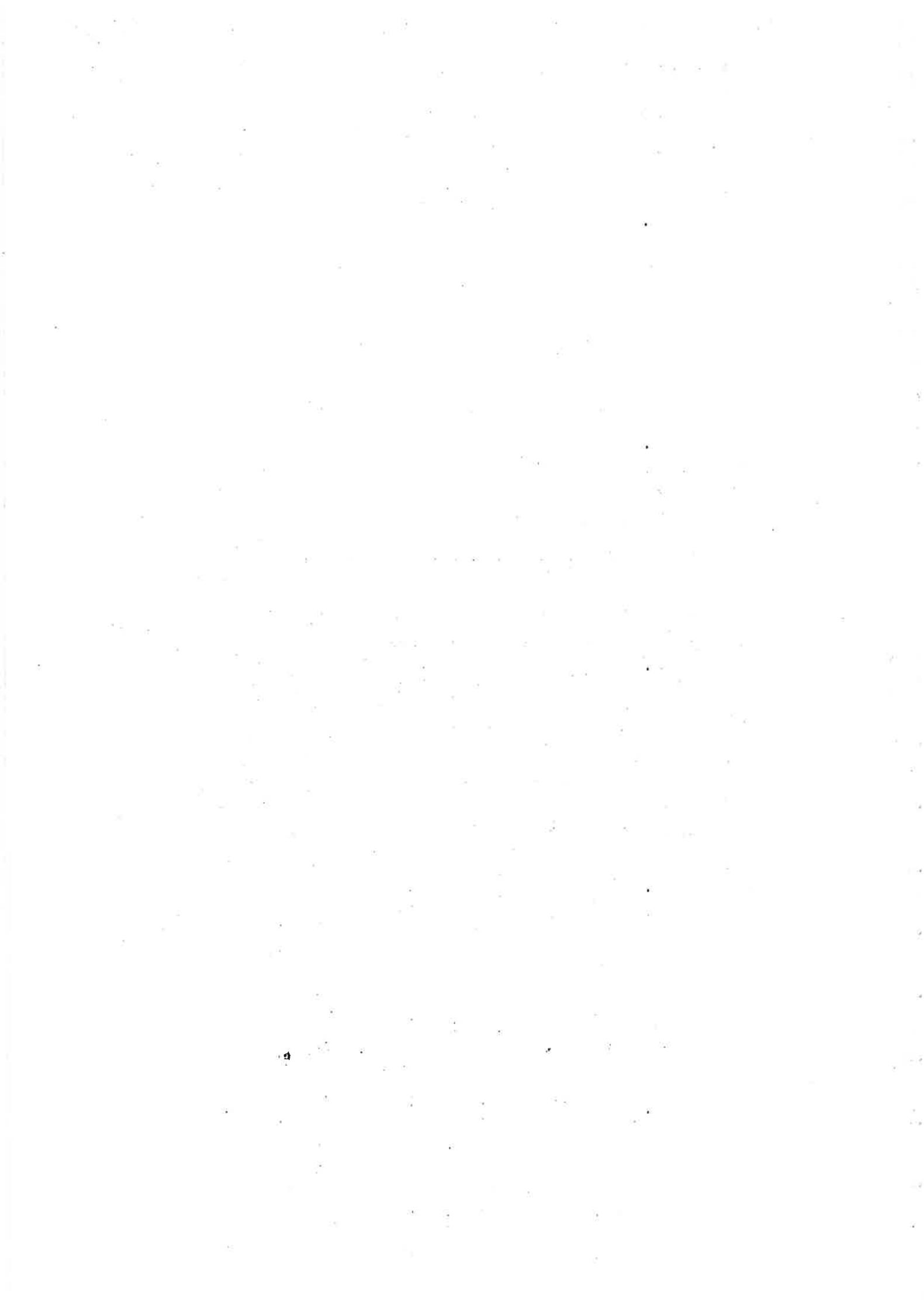
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-- End of Questions --



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END OF FIRST SEMESTER EXAMINATIONS: 2014/2015

UGBS 301: QUANTITATIVE METHODS (3 credits)

THREE (3) HOURS

version 3

**INSTRUCTIONS:** Answer ALL FIVE questions. All questions must be answered on the question sheet. Carefully plan your answers to fit the spaces provided. Relevant formulae and tables are provided.

1. The Ghana Military Academy plans to invite prospective candidates for recruitment training program. In all, the academy would like to add at least 1650 new personnel into the Ghana Armed Forces. However, for a fair representation of the major Ghanaian ethnic groups in the Ghana Armed Forces, the academy wishes to recruit at least twice as many people from Cluster 1 (comprising of Western, Central, Brong Ahafo, Eastern and Ashanti regions) as Cluster 3 (comprising of Greater Accra and Volta regions). In addition the number of recruits from Cluster 1 must be at most three times that from Cluster 2 (comprising of Northern, Upper West and Upper East regions). Also, there must be at most twice as many recruits from cluster 1 as Cluster 2 and Cluster 3 combined. In general, it cost the academy Ghc 1700, Ghc 1700 and Ghc 1600 to train new recruits (cost includes transportation, feeding, lodging, etc) from Cluster 1, Cluster 2 and Cluster 3 respectively.

- a. (10 marks) Formulate a linear programming problem to help the military academy decide on the number of people to recruit in order to achieve a fair representation of all ethnic groups at the lowest possible cost.

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- b. Below is a portion of the sensitivity report for the academy's fair representation recruitment program.

| Variable  | Final Value | Reduced Cost | Objective Coefficient | Allowable Increase | Allowable Decrease |
|-----------|-------------|--------------|-----------------------|--------------------|--------------------|
| Cluster 1 | 900         | 0            | 1700                  | 50                 | 133.3333333        |
| Cluster 2 | 300         | 0            | 1700                  | 1E+30              | 33.33333333        |
| Cluster 3 | 450         | 0            | 1600                  | 100                | 6133.333333        |

Table 1: Sensitivity Report for the military academy's LP problem

- i. (3 marks) How many recruits should be selected from Cluster 1, Cluster 2 and Cluster 3?

Cluster 1 =

Cluster 2 =

Cluster 3 =

- ii. (3 marks) What will be the total cost for training the recruits from cluster 1 and 3?

Total Cost =

- iii. (2 marks) Why are the Reduced Costs for Cluster 1, Cluster 2 and Cluster 3 zero?

- iv. (2 marks) If the cost of training a Cluster 3 recruit was to increase by GHC 10, what impact would this have on the suggested number of recruits for each cluster?

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2. The following are multiple choice questions. Show your work in the space provided and circle the correct answer.

i. (3 marks) Twenty five percent of vehicles in Ghana are not covered by insurance. On a particular weekend, 7 vehicles were involved in traffic accidents. Assume the number of accidents follows a binomial distribution. What is the probability that at least two of the vehicles are not covered by insurance?

- A. 0.034      B. 0.214      C. 0.555      D. 0.580      E. 0.712

ii. (3 marks) The Central Limit Theorem implies that

- A. Regardless of the sample proportion, as long as the sample size is large enough the distribution of the population means will be approximately normal.
- B. Regardless of the population mean, as long as the sample size is large enough the distribution of the sample means will be approximately normal.
- C. Regardless of the sample distribution, as long as the sample size is large enough the distribution of the population means will be approximately normal.
- D. Regardless of the population distribution, as long as the sample size is large enough the distribution of the sample means will be approximately normal.

iii. (3 marks) A population has a mean of 120 and a standard deviation of 25. Suppose a simple random sample of size 45 is selected and used to estimate  $\mu$ .

a. What is the probability that the sample mean will be at least 128?

- A. 0.498      B. 0.162      C. 0.028      D. 0.055      E. 0.0158

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iv. (3 marks) The legon branch of Ecobank Ghana would want to monitor the waiting time of its customers. The bank recorded the waiting time of 30 randomly selected customers. What is the confidence interval estimate for the population mean waiting time if the sample mean is  $\bar{x} = 16.5$  and the standard deviation is  $s = 4$ ? Assume a confidence coefficient of 0.95

- A.  $CI = 16.5 \pm 1.428$       B.  $CI = 16.5 \pm 1.930$       C.  $CI = 16.5 \pm 0.855$   
D.  $CI = 16.5 \pm 1.20$       E.  $CI = 16.5 \pm 1.021$

v. (3 marks) A regression model has a Total Sum of Squares ( $SST$ ) = 1700 and  $R^2 = 0.91$ . What is the corresponding Error Sum of Squares ( $SSE$ )?

- A. 153      B. 170      C. 1050      D. 90      E. 1190

- 3: The IT manager of the Ghana Revenue Authority is trying to convince the chief executive that a recently released tax preparatory software by TOPIX instruments is faster than that of the existing one by COMPUSOFT. Regardless of the software type, the tax preparatory process however requires inputting manually a customer's personal and business data. Six customers were randomly selected to use both the TOPIX and COMPUSOFT software for their tax preparation. The table below shows the time (in minutes) spent on both softwares.

|                  |    |    |    |    |    |    |
|------------------|----|----|----|----|----|----|
| <b>TOPIX</b>     | 57 | 55 | 67 | 68 | 59 | 52 |
| <b>COMPUSOFT</b> | 46 | 56 | 54 | 60 | 53 | 53 |

Table 2: Data on two competing tax preparatory software

a. (5 marks) State the appropriate null and alternative hypothesis

b. (10 marks) Based on the sample data, test the null hypothesis using a significance level of 0.01 and state your conclusion about the null hypothesis. Assume the population of differences has a normal distribution.

4. The University of Ghana (UG) branch of the University Teachers Association of Ghana (UTAG) are demanding that government pays them more than their colleagues at UCC- Cape Coast and KNUST- Kumasi because cost of living (comprising of accommodation, feeding and utility bills) for an average household of four is higher in Accra than in the other cities. Keen to disprove their claim, the government statistician selected the following major communities in the three cities where the majority of UTAG members reside and recorded their average monthly living expenses.

| UG (Accra) |                | UCC (Cape Coast) |                | KNUST (Kumasi) |                |
|------------|----------------|------------------|----------------|----------------|----------------|
| Community  | Living expense | Community        | Living expense | Community      | Living expense |
| Madina     | 2200           | Ola Estate       | 1750           | Ahensan        | 2000           |
| Haaftso    | 1995           | Elmina           | 1550           | Bomso          | 1800           |
| Adenta     | 2310           | Abora            | 1700           | Ayigya         | 1850           |
| Tema       | 2450           | Cape Central     | 2100           | Ahomoso        | 1550           |
| East Legon | 2685           | Pedu             | 1750           | Boadi          | 1850           |
|            |                | Kotokoraba       | 1850           | Ayiduase       | 1750           |

Table 3: Average living expenses of UG, UCC and KNUST UTAG members.

Let  $u_1$ ,  $u_2$ , and  $u_3$  be the mean of the living expenses of all (population of) UTAG members for UG, UCC and KNUST respectively. Assume the Total Sum of Squares, and the Grand Mean of the living expenses for the three cities are given as  $SST = 1564344.12$ , and  $\bar{x} = 1949.41$  respectively.

a. (4 marks) State the appropriate hypothesis test for the UTAG living expense study.

## ANOVA-

| <i>Source of Variation</i> | <i>SS</i>  | <i>df</i> | <i>MS</i> | <i>F</i> | <i>P-value</i> | <i>F crit</i> |
|----------------------------|------------|-----------|-----------|----------|----------------|---------------|
| Between Groups             |            |           |           |          | 0.00065        | 3.738892      |
| Within Groups              |            |           |           |          |                |               |
| Total                      | 1564344.12 |           |           |          |                |               |

- c. (3 marks) At the  $\alpha=0.05$  level of significance, can you conclude that there are differences in the average living expenses between UTAG members from UG, UCC and KNUST? Why or why not?

d. (10 marks) Using Tukey-Kramer's comparison approach, test if there exist a difference between the mean living expense for UTAG members at UG compared to UCC, UG compared to KNUST and UCC compared to KNUST. Test using a  $q_\alpha = 3.07$

e. As the government statistician, summarize the conclusion of your study to the government including your recommendation regarding UG UTAG's demand based on the results from the ANOVA table and your answers to question d above.

5. The Association of Ghanaian Universities (AGU) would want to ascertain whether class size has any relationship at all with student performance in Business courses. The following data shows the class size and the associated average class performance from ten randomly selected business courses from universities across the country. Also included are additional calculations on class size and average performance scores. The AGU desire a coefficient of determination of at least 95% for the model to be considered a good fit.

| Class size ( $x_i$ ) | Performance ( $y_i$ ) |
|----------------------|-----------------------|
| 35                   | 80                    |
| 42                   | 76                    |
| 80                   | 70                    |
| 105                  | 63                    |
| 200                  | 55                    |
| 250                  | 45                    |
| 320                  | 39                    |
| 30                   | 78                    |
| 40                   | 77                    |
| 81                   | 66                    |
| <b>Sum</b>           | <b>1183</b>           |
|                      | <b>649</b>            |

Useful data about the table above:

$$\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y}) = -13073.7,$$

$$\sum_{i=1}^n (x_i - \bar{x})^2 = 94426.1$$

$$\sum_{i=1}^n (y_i - \bar{y})^2 = 1864.9$$

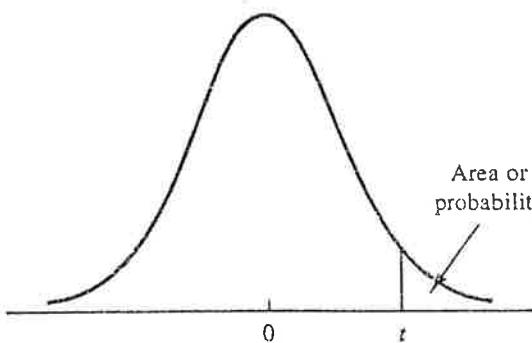
a. (5 marks) Develop a scatter diagram for these data with class size as the independent variable.

- b. (2 marks) What does the scatter diagram developed in part (a) indicate about the relationship between class size and class performance?
- c. (8 marks) Using least squares method, calculate  $b_0$  and  $b_1$  to develop an estimated regression equation model for the relationship between class size and class performance. Where  $b_0$  is the  $y$  intercept of the estimated regression line, and  $b_1$  is the slope of the estimated regression line.
- d. (2 marks) Use the estimated regression equation to predict the average class performance for a class size of 280 students.
- e.
- i. (3 marks) What is the coefficient of determination,  $r^2$  assuming Sum of Squares Error (SSE) = 54.79?

ii. (2 marks) What does the  $R^2$  value mean?

iii. Do you think the regression model is a good fit for the data? Explain.

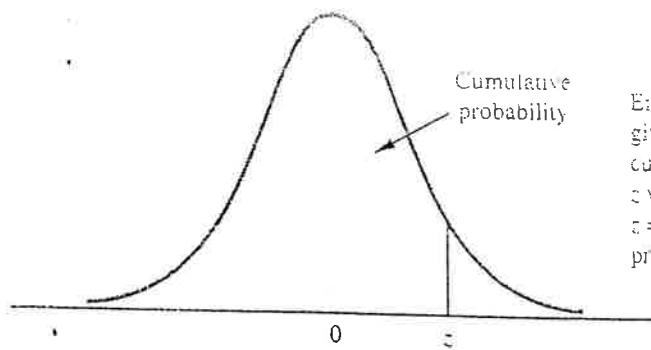
f. (3 marks) The government of Ghana recently issued a directive to all Vice Chancellors of public universities to increase first year admissions into Business courses by 10% annually for the next 10 years to meet the growing demand of business graduates. As president of AGU what conclusion(s) will you draw from the regression analysis and what would be your advice to the government of Ghana based on the findings from the regression?

TABLE 2 *t* DISTRIBUTION

Entries in the table give *t* values for an area or probability in the upper tail of the *t* distribution. For example, with 10 degrees of freedom and a .05 area in the upper tail,  $t_{.05} = 1.812$ .

| Degrees<br>of Freedom | Area in Upper Tail |       |       |        |        |        |
|-----------------------|--------------------|-------|-------|--------|--------|--------|
|                       | .20                | .10   | .05   | .025   | .01    | .005   |
| 1                     | 1.376              | 3.078 | 6.314 | 12.706 | 31.821 | 63.656 |
| 2                     | 1.061              | 1.886 | 2.920 | 4.303  | 6.965  | 9.925  |
| 3                     | .978               | 1.638 | 2.353 | 3.182  | 4.541  | 5.841  |
| 4                     | .941               | 1.533 | 2.132 | 2.776  | 3.747  | 4.604  |
| 5                     | .920               | 1.476 | 2.015 | 2.571  | 3.365  | 4.032  |
| 6                     | .906               | 1.440 | 1.943 | 2.447  | 3.143  | 3.707  |
| 7                     | .896               | 1.415 | 1.895 | 2.365  | 2.998  | 3.499  |
| 8                     | .889               | 1.397 | 1.860 | 2.306  | 2.896  | 3.355  |
| 9                     | .883               | 1.383 | 1.833 | 2.262  | 2.821  | 3.250  |
| 10                    | .879               | 1.372 | 1.812 | 2.228  | 2.764  | 3.169  |
| 11                    | .876               | 1.363 | 1.796 | 2.201  | 2.718  | 3.106  |
| 12                    | .873               | 1.356 | 1.782 | 2.179  | 2.681  | 3.055  |
| 13                    | .870               | 1.350 | 1.771 | 2.160  | 2.650  | 3.012  |
| 14                    | .868               | 1.345 | 1.761 | 2.145  | 2.624  | 2.977  |
| 15                    | .866               | 1.341 | 1.753 | 2.131  | 2.602  | 2.947  |
| 16                    | .865               | 1.337 | 1.746 | 2.120  | 2.583  | 2.921  |
| 17                    | .863               | 1.333 | 1.740 | 2.110  | 2.567  | 2.898  |
| 18                    | .862               | 1.330 | 1.734 | 2.101  | 2.552  | 2.878  |
| 19                    | .861               | 1.328 | 1.729 | 2.093  | 2.539  | 2.861  |
| 20                    | .860               | 1.325 | 1.725 | 2.086  | 2.528  | 2.845  |
| 21                    | .859               | 1.323 | 1.721 | 2.080  | 2.518  | 2.831  |
| 22                    | .858               | 1.321 | 1.717 | 2.074  | 2.508  | 2.819  |
| 23                    | .858               | 1.319 | 1.714 | 2.069  | 2.500  | 2.807  |
| 24                    | .857               | 1.318 | 1.711 | 2.064  | 2.492  | 2.797  |
| 25                    | .856               | 1.316 | 1.708 | 2.060  | 2.485  | 2.787  |
| 26                    | .856               | 1.315 | 1.706 | 2.056  | 2.479  | 2.779  |
| 27                    | .855               | 1.314 | 1.703 | 2.052  | 2.473  | 2.771  |
| 28                    | .855               | 1.313 | 1.701 | 2.048  | 2.467  | 2.763  |
| 29                    | .854               | 1.311 | 1.699 | 2.045  | 2.462  | 2.756  |
| 30                    | .854               | 1.310 | 1.697 | 2.042  | 2.457  | 2.750  |
| 31                    | .853               | 1.309 | 1.696 | 2.040  | 2.453  | 2.744  |
| 32                    | .853               | 1.309 | 1.694 | 2.037  | 2.449  | 2.738  |
| 33                    | .853               | 1.308 | 1.692 | 2.035  | 2.445  | 2.733  |
| 34                    | .852               | 1.307 | 1.691 | 2.032  | 2.441  | 2.728  |

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Entries in the table give the area under the curve to the left of the  $z$  value. For example, for  $z = 1.25$ , the cumulative probability is .8944.

| $z$ | .00   | .01   | .02   | .03   | .04   | .05   | .06   | .07   | .08   | .09   |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| .0  | .5000 | .5040 | .5080 | .5120 | .5160 | .5199 | .5239 | .5279 | .5319 | .5359 |
| .1  | .5398 | .5438 | .5478 | .5517 | .5557 | .5596 | .5635 | .5675 | .5714 | .5753 |
| .2  | .5793 | .5832 | .5871 | .5910 | .5948 | .5987 | .6026 | .6064 | .6103 | .6141 |
| .3  | .6179 | .6217 | .6255 | .6293 | .6331 | .6368 | .6406 | .6443 | .6480 | .6517 |
| .4  | .6554 | .6591 | .6628 | .6664 | .6700 | .6736 | .6772 | .6808 | .6844 | .6879 |
| .5  | .6915 | .6950 | .6985 | .7019 | .7054 | .7088 | .7123 | .7157 | .7190 | .7224 |
| .6  | .7257 | .7291 | .7324 | .7357 | .7389 | .7422 | .7454 | .7486 | .7517 | .7549 |
| .7  | .7580 | .7611 | .7642 | .7673 | .7704 | .7734 | .7764 | .7794 | .7823 | .7852 |
| .8  | .7881 | .7910 | .7939 | .7967 | .7995 | .8023 | .8051 | .8078 | .8106 | .8133 |
| .9  | .8159 | .8186 | .8212 | .8238 | .8264 | .8289 | .8315 | .8340 | .8365 | .8389 |
| 1.0 | .8413 | .8438 | .8461 | .8485 | .8508 | .8531 | .8554 | .8577 | .8599 | .8621 |
| 1.1 | .8643 | .8665 | .8686 | .8708 | .8729 | .8749 | .8770 | .8790 | .8810 | .8830 |
| 1.2 | .8849 | .8869 | .8888 | .8907 | .8925 | .8944 | .8962 | .8980 | .8997 | .9015 |
| 1.3 | .9032 | .9049 | .9066 | .9082 | .9099 | .9115 | .9131 | .9147 | .9162 | .9177 |
| 1.4 | .9192 | .9207 | .9222 | .9236 | .9251 | .9265 | .9279 | .9292 | .9306 | .9319 |
| 1.5 | .9332 | .9345 | .9357 | .9370 | .9382 | .9394 | .9406 | .9418 | .9429 | .9441 |
| 1.6 | .9452 | .9463 | .9474 | .9484 | .9495 | .9505 | .9515 | .9525 | .9535 | .9545 |
| 1.7 | .9554 | .9564 | .9573 | .9582 | .9591 | .9599 | .9608 | .9616 | .9625 | .9633 |
| 1.8 | .9641 | .9649 | .9656 | .9664 | .9671 | .9678 | .9686 | .9693 | .9699 | .9706 |
| 1.9 | .9713 | .9719 | .9726 | .9732 | .9738 | .9744 | .9750 | .9756 | .9761 | .9767 |
| 2.0 | .9772 | .9778 | .9783 | .9788 | .9793 | .9798 | .9803 | .9808 | .9812 | .9817 |
| 2.1 | .9821 | .9826 | .9830 | .9834 | .9838 | .9842 | .9846 | .9850 | .9854 | .9857 |
| 2.2 | .9861 | .9864 | .9868 | .9871 | .9875 | .9878 | .9881 | .9884 | .9887 | .9890 |
| 2.3 | .9893 | .9896 | .9898 | .9901 | .9904 | .9906 | .9909 | .9911 | .9913 | .9916 |
| 2.4 | .9918 | .9920 | .9922 | .9925 | .9927 | .9929 | .9931 | .9932 | .9934 | .9936 |
| 2.5 | .9938 | .9940 | .9941 | .9943 | .9945 | .9946 | .9948 | .9949 | .9951 | .9952 |
| 2.6 | .9953 | .9955 | .9956 | .9957 | .9959 | .9960 | .9961 | .9962 | .9963 | .9964 |
| 2.7 | .9965 | .9966 | .9967 | .9968 | .9969 | .9970 | .9971 | .9972 | .9973 | .9974 |
| 2.8 | .9974 | .9975 | .9976 | .9977 | .9977 | .9978 | .9979 | .9979 | .9980 | .9981 |
| 2.9 | .9981 | .9982 | .9982 | .9983 | .9984 | .9984 | .9985 | .9985 | .9986 | .9986 |
| 3.0 | .9987 | .9987 | .9987 | .9988 | .9988 | .9989 | .9989 | .9989 | .9990 | .9990 |

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BSc. ADMINISTRATION FIRST SEMESTER EXAMINATIONS: 2016/2017

UGBS 303: COMPUTER APPLICATIONS IN BUSINESS (3 CREDITS)

ANSWER ANY FOUR (4) QUESTIONS OUT OF FIVE (5)

TIME ALLOWED: 2 HOURS 30 MINUTES

**Q1.** The manager of *PizzChil*, a local pizza company at Adenta, is torn between launching a website or cultivating a strong social media presence to support sales.

- a) Discuss which in your opinion (website or social media) would be hugely beneficial to *PizzChil* and why (13 marks)

- b) Mention THREE potential challenges that your choice presents to *PizzChil*.

(7 marks)

**Q2.** Microsoft Excel has many key features including charts tools.

- a) Briefly explain how useful charts are in Excel (4 marks)

- b) State and compare THREE (3) chart types in Excel

(6 marks)

- c) Using relevant cell addresses, write appropriate formulas (functions) for the operations in I to IV based on the spreadsheet below.

| SNO   | Name  | Finance | Statistics | Accounting | Total | Average |
|-------|-------|---------|------------|------------|-------|---------|
| 1     | Naana | 70      | 80         | 87         | --    | --      |
| 2     | Kwesi | 90      | 98         | 89         | --    | --      |
| 3     | Esi   | 90      | 90         | 98         | --    | --      |
| 4     | Adjoa | 60      | 76         | 79         | --    | --      |
| 5     | Abena | 50      | 45         | 67         | --    | --      |
| Max   |       |         |            | --         |       |         |
| Total |       | --      |            |            |       |         |

Write Excel formulas/functions to:

- i. calculate the total marks as sum of Finance, Statistics & Accounting for Kwesi and Adjoa to be displayed in appropriate cells in column F.  
**(2 marks)**
- ii. calculate the average marks for Naana, Esi, and Abena to be displayed in relevant cells in column G.  
**(2 marks)**
- iii. calculate the highest (maximum) mark for Statistics and display in cell D7.  
**(3 marks)**
- iv. count students' Finance scores greater than 70  
**(3 marks)**

Q3.

- a) Briefly explain the following Excel functions  
**(2 marks)**
  - i. PMT
  - ii. PPMT
  - iii. IPMT
- b) Explain each of the terms in the PMT syntax shown below  
= PMT (rate, nper, pv, fv, type)  
**(5 marks)**
- c) Write a PMT Excel function to calculate a GHC 20,000 loan at an annual rate of 16% that must be paid off in 20 months. Note payment is due at the beginning of the period.  
**(4 marks)**
- d) Write a PMT Excel function to calculate a GHC 50,000 loan at an annual rate of 20% that must be paid off in 20 months where payment is due at the end of the period.  
**(5 marks)**

Q4. Using definitions and appropriate examples, compare and contrast the following:

**(3 marks each)**

- a) Entities -AND- Attributes
- b) Primary key -AND- Foreign key

- c) Database –AND- Database model
- d) Relative –AND- absolute *cell referencing*
- e) Cascade update related field option –AND- Cascade delete related record option
- f) Define referential integrity and its importance in database design

(5 marks)

- Q5. A company database contains information about employees, departments and projects. There are several departments in the company where each department has a unique identification number, a name, location of the office and a particular employee who manages the department. A department controls a number of projects, each of which has unique name, a unique number and the budget. In addition, each employee has a name, an identification number, address, salary, and birthdate. An employee is assigned to one department but can join in several projects. We need to record the start date of employees in each project as well as to know the direct supervisor of each employee. We want to keep track of the dependents of the employees. Each dependent has name, birthdate and relationship with the employee.

- a. List all entities in a tabular format with their relevant attributes

[6 marks]

- b. Draw an entity relationship diagram for the company and indicate the type of relationship that exists between the entities.

(8 marks)

- c. Underline the primary and foreign keys in the entity relationship diagram.

(6 marks)





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BSc. BUSINESS ADMINISTRATION  
FIRST SEMESTER EXAMINATIONS 2015/2016  
UGBS 303: COMPUTER APPLICATIONS IN MANAGEMENT (3 CREDITS)

ANSWER ALL QUESTIONS  
TIME ALLOWED: TWO (2) HOURS

1. You have been contacted to design a database for UGBS Guest Centre. The Guest Centre provides accommodation for visiting scholars and the general public. The following scenario describe things that must be captured in the database:

The Center has 500 rooms, a manpower of 50 employees and 3 divisions, namely administration, operations and housekeeping. The Centre's policy allows for a guest to occupy more than one room. Also, each employee at the Centre must belong to only one division. Each employee is assigned one mobile phone and this must also be captured by the database.

Based on the scenario above, answer the following questions:

- A. Identify all entities and decide on appropriate attributes, primary and foreign keys as well as relationships among the entities. [15 MARKS]
  - B. Draw an entity relationship diagram for UGBS Guest Centre showing all entities, relationships and cardinalities. [10 MARKS]
2. Based on the entity relationship diagram designed in Question 1, answer the following questions.
- A. Enumerate the steps in which the entities can be transformed into tables with appropriate relationships. [10 MARKS]
  - B. Describe how the form view can be used to create a form for data entry into a table. [7 MARKS]
  - C. List the steps in using the report wizard to create a report for two related tables. [8 MARKS]

3. University of Ghana Business School (UGBS) seeks a loan amount of Five Million US Dollars (\$5,000,000) to enable expansion to other countries such as Nigeria, South Africa and Gambia. The School intends to pay off the loan in four years (4 years) based on a monthly interest rate of three percent (3%). Using the assumptions above and appropriate excel functions, calculate the following:
- A. Periodic monthly payment UGBS will have to make every month if payment is done at the beginning of the period. [5 MARKS]
- B. Interest and principal payment components for the 7<sup>th</sup> month of the monthly payment respectively. [5 MARKS]
- C. Draw a loan amortization table for the entire loan detailing monthly payment periods, principal payment, interest payment, monthly interest payment and loan balance for each period if payment is done at the end of the month. [15 MARKS]

4. Write the HTML codes to design the webpage below.

**Registration Form**

**Fillout this form to reserve a seat**

**Full Name:**

**Email:**

**Gender:**  Male  Female

**College:**

**Will you stay for refreshment?**  Yes  No

**Upload your picture:**  Choose file No file chosen

**Any comment:**

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[25 MARKS]

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FIRST SEMESTER EXAMINATION: 2018/2019

BA/BSc. BUSINESS ADMINISTRATION

UGBS 303: COMPUTER APPLICATIONS IN MANAGEMENT (3 CREDITS)

ANSWER ANY FOUR (4) QUESTIONS FROM THE FIVE (5) QUESTIONS

TIME ALLOWED: 2 HOURS 30 MINUTES

**QUESTION 1**

- a) Software is basically categorized into two main types as Systems software and Application software. With an example each, briefly distinguish between these two software types.  
(5 Marks)
- b) With an example each, briefly explain the following software concepts:  
i. Multitasking  
ii. Multithreading  
iii. Time-sharing  
iv. Command-based User Interface  
v. Graphical User Interface (GUI)  
(10 Marks)
- c) The Internet (International Network) is defined as a global computer network which provides a variety of information and communication facilities and consist of interconnected networks using standardized communication protocols. There are several services that run on the Internet. Briefly explain each of the services below and give one example each.  
i. Chat (Internet Relay Chat)  
ii. E-mail  
iii. File transfer protocol (FTP)  
iv. Search Engines  
v. World Wide Web (www)  
(10 Marks)

## QUESTION 2

- a) The Microsoft Excel worksheet below shows details of a loan that Mr. Entee took from his bank to buy a car.

|   | A                                   | B        |
|---|-------------------------------------|----------|
| 1 | <i>Home Loan (PV)</i>               | ₵ 1,0000 |
| 2 | <i>Interest rate (Rate)</i>         | 10%      |
| 3 | <i>Term of loan in years (Nper)</i> | 2        |
| 4 |                                     |          |
| 5 | <i>Monthly payment (PMT)</i>        |          |
| 6 | <i>Total payment</i>                |          |
| 7 | <i>Future value (Fv)</i>            |          |

Based on the loan details in the worksheet, write Excel Functions to compute the following loan payment parameters:

- i. Monthly payments of the loan (PMT)
- ii. Total payments of the loan for the 2-year period
- iii. Future value of the loan payment (Fv)

(6 Marks)

- b) Describe the following web search techniques. Give appropriate examples to illustrate their use.

- i. Quotation marks (" ")
- ii. Wild card operators
- iii. Minus (-) sign operator
- iv. "AND" Boolean operator
- v. "OR" Boolean operator

(15 Marks)

- c) As part of the effort to motivate sales agents to improve their daily sales, MaesTec Business Solutions have decided to remunerate their agents based on their daily sales. Using cell A1 as the referencing cell for the daily sales, write down the Microsoft Excel Function for allocating the reward based on the following conditions:

- Allocate 10 cedis if an agent makes daily sales < 200 cedis
- Allocate 20 cedis if an agent makes daily sales from 200 - 299 cedis
- Allocate 30 cedis if an agent makes daily sales from 300 - 399 cedis
- Allocate 40 cedis if an agent makes daily sales  $\geq 400$

(4 Marks)

### QUESTION 3

- a) What is **Cell reference** in Microsoft Excel? (5 Marks)
- b) Explain the following cell referencing strategies and ONE (1) example each to reflect on your understanding of cell referencing.
- Relative cell reference
  - Absolute cell reference
  - Mixed cell reference
- (15 Marks)
- c) Briefly describe how the *google web crawler* searches for information on the web. (5 Marks)

### QUESTION 4

- a) The University of Ghana SRC executives plan to use Microsoft access database management system to keep records of all the first year students of the University. As a student who has studied Microsoft Access, answer the following.
- Distinguish between *database* and *database management system*
  - State and explain FOUR (4) components of access database management system
  - State and explain FOUR (4) functions of relational database management system
- (15 Marks)
- b) What is the difference between each of the following database management concepts.
- Entities and Attributes
  - Fields and Records
  - Primary keys and Foreign keys
  - Relationships and Referential Integrity
- (10 Marks)

## QUESTION 5

- a) Microsoft PowerPoint comes with a lot of features that can enhance your presentation.  
 Briefly explain the following features in Microsoft PowerPoint.

- i. Themes
- ii. Transitions
- iii. Animations

(9 Marks)

- b) Consider the worksheet below:

|    | A  | B                | C                           | D     | E      |
|----|----|------------------|-----------------------------|-------|--------|
| 1  | ID | NAME             | COURSE                      | MARKS | STATUS |
| 2  | 23 | Owusu Acheampong | Software Engineering        | 60    | Pass   |
| 3  | 24 | Billy Mensah     | Requirement Engineering     | 50    | Fail   |
| 4  | 25 | Awuni Emmanuel   | Multivariate Calculus       | 34    | Fail   |
| 5  | 26 | Frimpong Boateng | Software Architecture       | 96    | Pass   |
| 6  | 27 | Daniel Mensah    | Relational DBMS             | 70    | Pass   |
| 7  | 28 | Bismark Owusu    | PHP development             | 34    | Fail   |
| 8  | 29 | Philippa Ashun   | Microsoft Dot Net Platforms | 78    | Pass   |
| 9  | 30 | Michael Boateng  | HTML & Scripting            | 87    | Pass   |
| 10 | 31 | Jemima Sarpong   | Data Communication          | 78    | Pass   |
| 11 | 32 | Olivia Dadzie    | Computer Networks           | 89    | Pass   |

- i. Write down the "IF" Function for the *status column* by using the condition:  
*If the mark in D column is  $\geq 60$  then return "Pass" otherwise "Fail" as indicated.*
- ii. Write down the AVERAGEIF Function to find the average of the marks that are greater than ( $>$ ) 50.
- iii. Write down the COUNTIF Function to count all the students who have marks more than ( $>$ ) 60.
- iv. Describe how you will set a Conditional Formatting for status column (Cell E) to highlight the cell when the value = "Fail".

(16 Marks)



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BA/BSc. ADMINISTRATION FIRST SEMESTER EXAMINATIONS: 2017/2018

UGBS 303: COMPUTER APPLICATIONS IN MANAGEMENT (3 CREDITS)

ANSWER ANY FOUR (4) QUESTIONS OUT OF FIVE (5)

TIME ALLOWED: 2 HOURS 30 MINUTES

Q1. The local government ministry plans to create a database to store its records in all district assembly offices.

a) State THREE database management software that can be used for this project.

(3 marks)

b) Explain THREE benefits the use of the database will bring to the ministry's work.

(9 marks)

c) State TWO ways of preventing unauthorized access to the ministry's database.

(5 marks)

d) Using relevant examples, distinguish between a data mart and a data warehouse.

(8 marks)

Q2. a) Write short notes on the following technologies.

- i. Blog.
- ii. Cloud computing
- iii. Web 2.0
- iv. Instant messaging
- v. Social media

(3 marks each)

b) Which of the technologies in 2a) would you select as the odd one out and why?

(5 marks)

- c) With the exception of the odd one you chose in (2b) select another one which is an umbrella term for the rest of the technologies. Explain your choice. (5 marks)

- Q3** a). With relevant examples, briefly explain the difference between a business function and a business process. (5 marks)
- b) State and explain **FOUR** reasons why companies seek to improve, automate or re-engineer their business processes. (12 marks)
- c) Draw and name **FOUR** BPMN 2.0 notations used in business process modelling. (8 marks)

**Q4.** Using the “monthly household expenditure” table, answer the following questions.

| A                     | B    | C    | D    | E    | F   | G    | H    | I       |
|-----------------------|------|------|------|------|-----|------|------|---------|
|                       | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Average |
| House Rent            | 750  | 650  | 750  | 750  | 750 | 750  | 750  |         |
| Charity               | 200  | 300  | 200  | 200  | 200 | 200  | 300  |         |
| Groceries             | 300  | 425  | 300  | 440  | 430 | 250  | 300  |         |
| Public Transportation | 300  | 215  | 330  | 200  | 300 | 450  | 200  |         |
| Fuel                  | 45   | 60   | 75   | 300  | 60  | 550  | 300  |         |
| Clothing              | 100  | 75   | 55   | 330  | 75  | 95   | 300  |         |
| Utilities             | 150  | 120  | 200  | 300  | 120 | 140  | 45   |         |
| Phone credits         | 35   | 55   | 25   | 35   | 55  | 80   | 100  |         |

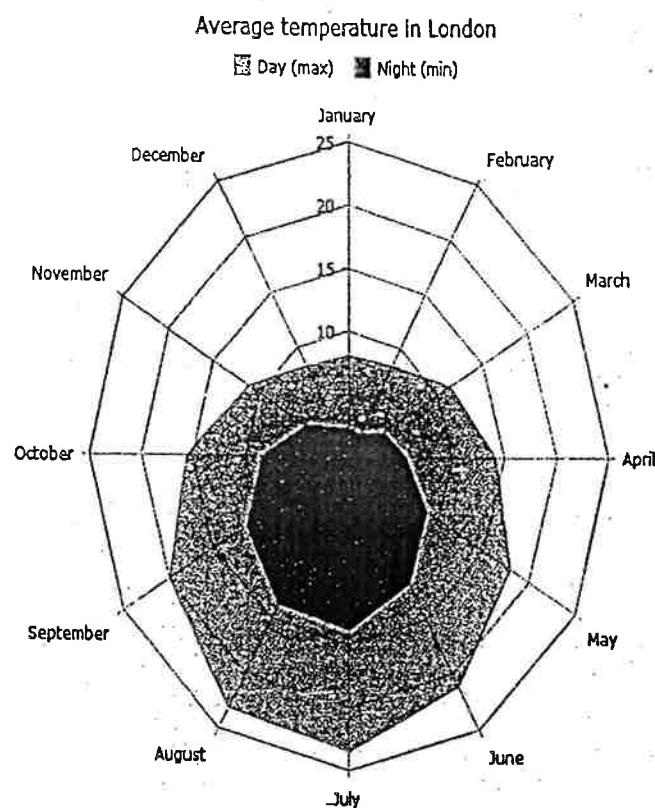
- a) Name **THREE** Excel chart types that will be appropriate in showing all the household expenditure against the months in one chart. (6 marks)
- b) Describe how you will automatically increase all the expenditures by 50% in an Excel application. *Note: Don't perform calculations.* (8 marks)
- c) Write appropriate Excel formulas to find the maximum expenditure in April and the minimum expenditure in June. (6 marks)
- d) Write an Excel function to count the number of items in column A. (8 marks)

**Q5.** The following questions are meant to test your knowledge of data visualization.

a)

- i. What is the name of the chart below?

(4 marks)



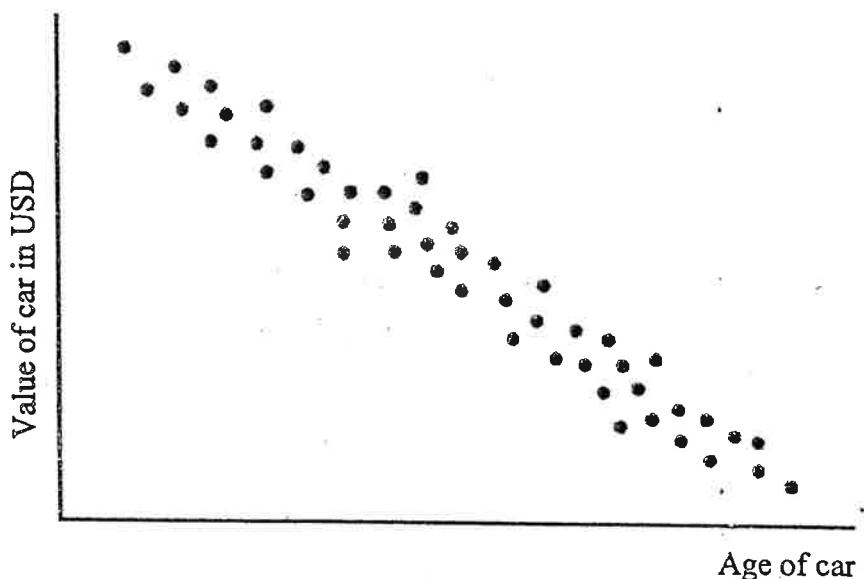
- ii. What was the average night temperature in April?

(3 marks)

- iii. Which two different months recorded the same value for the night temperature and same values for day temperatures?

(6 marks)

b) What is the name of the chart below



- i. When is it appropriate to use the chart identified?  
(3 marks)
- ii. What is the strength of relationship between the variables 'value of car' and 'Age of car'? Hint: Is it strong, moderate or weak?  
(3 marks)
- iii. Is the relationship positive or negative?  
(3 marks)



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BSc. BUSINESS ADMINISTRATION FIRST SEMESTER EXAMINATIONS: 2014/2015

UGBS 303: COMPUTER APPLICATIONS IN MANAGEMENT (3 CREDITS)

INSTRUCTIONS

THIS PAPER IS DIVIDED INTO TWO (2) SECTIONS.

ANSWER TWO QUESTIONS IN SECTION A: QUESTION 1 AND ANY OTHER QUESTION  
AND ANSWER ALL QUESTIONS IN SECTION B. ANSWER BOTH SECTIONS IN THE  
ANSWER BOOKLET.

TIME ALLOWED: TWO HOURS FIFTEEN MINUTES (2.15 HOURS)

SECTION A [30 MARKS]

1. BlackDecimal Limited is a nationwide provider of car rental services. The company has fleet of cars and professional drivers to facilitate their car rental business. Each driver is assigned to only one car and the companies hiring policy dictates that every rental transaction must indicate the rental number, date of rental, amount paid, date of return and the car rented. The details of the cars that are recorded are VIN, model, year of manufacturing, brand and registration number. The driver details recorded are License Number, First Name, Last Name, Address and CellPhone Number.

a. Identity the ENTITIES, their respective ATTRIBUTES, IDENTIFIERS and RELATIONSHIPS and DRAW an Entity relationship diagram with referential constraints for BlackDecimal Limited. (20 Marks)

2. Write brief notes with appropriate examples on the following terminologies?

- a) Data Type
- b) Foreign Key
- c) Relative Referencing
- d) One-to-one relationship
- e) Candidate Key

(10 Marks)

3. Using the nested IF Function, write an excel expression to assign an appropriate grade to marks obtained in an examination based on the following ranges. [100-80=A, 79-75=B+, 74-70=B, 69-55=C+, 54-50=C, 49-45=D, 44-0=E] (10 Marks)

## SECTION B [40 MARKS]

ANSWER ALL QUESTIONS IN THIS SECTION

1) A spreadsheet \_\_\_\_\_

- A) is another word for a letter written on a computer.
- B) is the core of a slide presentation.
- C) is an electronic file that contains a grid of columns and rows for related data.
- D) is an electronic file that is used to write text and graphics on the web.

2) By selecting the \_\_\_\_\_ option, you can make sure that data entered into a related table first exists in the primary table.

- A) form wizard
- B) query wizard
- C) sort
- D) referential integrity

3) A relational database is a collection of:

- A) common fields.
- B) related tables.
- C) field values.
- D) forms.

4) The \_\_\_\_\_ view in Access looks similar to an Excel Spreadsheet.

- A) Datasheet
- B) Design
- C) Form
- D) Report

5) Auto Fill \_\_\_\_\_

- A) is adjustable so you can display more or less characters in a column.
- B) is the fastest way to type A1 in the name box.
- C) helps carry over the fill to the remaining worksheets.
- D) enables you to copy the contents of a cell or to continue a sequence by dragging the fill handle.

| Table1    |           |            |                  |
|-----------|-----------|------------|------------------|
| Client ID | Last Name | First Name | Telephone Number |
| 2145      | Jennings  | Robert     | 212-988-0925     |
| 2523      | Stevens   | Jerry      | 212-788-3267     |
| 2341      | Lopez     | Miguel     | 212-457-8723     |
| 2467      | Stevens   | Derick     | 212-788-3267     |
| 2734      | Riker     | William    | 212-566-1701     |

6) In the table pictured above, each column represents a:

- A) record.
- B) table.
- C) primary key.
- D) field.

7) In the table pictured above, the last row of data shown (2734, Riker, William, 212-566-1701.) is a:

- A) form.
- B) key.
- C) field.
- D) record.

8) A field, or a combination of fields, that has a unique value is a:

- A) foreign key
- B) primary key
- C) field value
- D) table

9) Two or more tables which contain duplicate data is an example of \_\_\_\_\_.

- A) many-to-many relationships
- B) data redundancy
- C) data backup
- D) one-to-many relationships

10) The \_\_\_\_\_ determines what field values are allowed and what other properties the field will have.

- A) data type
- B) identity
- C) attribute
- D) record type

11) Appear, Fade, Fly In, and Swivel are all types of:

- A) animations.
- B) transitions.
- C) templates.
- D) themes.

12) Sarah is working in a database that stores resort vacation information. She needs to design a field that will allow a user to link to an external website. The data type she should apply to this field is:

- A) OLE
- B) Attachment
- C) Hyperlink
- D) Memo

13) Of the following, which is NOT a method to return to a previously-viewed slide?

- A) Press the left arrow
- B) Press N
- C) Press Backspace
- D) Press Page Up

14) Choosing the layout for a slide is done by clicking the \_\_\_\_\_ arrow on the \_\_\_\_\_ tab.

- A) New Slide; Insert
- B) New Layout; Home
- C) Slide; Design
- D) New Slide; Home

15) The left pane of a standard PowerPoint window contains the \_\_\_\_\_ and \_\_\_\_\_ tabs.

- A) Add-Ins; Outline
- B) Slides; Slide Show
- C) Slides; Outline
- D) Slides; View

16) Changing the order of slides or deleting one or more slides is most easily done in \_\_\_\_\_ view.

- A) Presenter
- B) Slide Sorter
- C) Reading
- D) Slide Show

17) All of the following are arguments of the built-in PMT function EXCEPT:

- A) Rate
- B) Future value
- C) Loan payment
- D) Present value

18) Joe is working in a database that stores client data. He needs to design a field that will assign a client ID number each time a user enters a new client. The data type he should apply to this field is:

- A) Number
- B) AutoNumber
- C) Text
- D) Memo

19) The \_\_\_\_\_ tab contains all the tools necessary for producing tables, forms, and queries in Access.

- A) Database Tools
- B) Create
- C) External Data
- D) Home

20) A form can be used to:

- A) automate the retrieval and update process.
- B) select records that meet specific criteria.
- C) sort data in ascending or descending order.
- D) enter, edit, and view records in a database.

21) The fill handle (as it applies to Excel 2010)

- A) is the same action as pressing "enter".
- B) is the fastest way to type A1 in the name box.
- C) is a small black square at the bottom-right corner of a cell that facilitates fill operations.
- D) helps carry over the fill to the remaining slides.

22) Katie is working in a customer table and needs to know if any customers are located in Texas. In order to locate this information, she would:

- A) create a new table.
- B) create a report.
- C) create a query.
- D) create a form.

23) A form can best be described as a(n):

- A) object.
- B) table.
- C) record.
- D) attribute.

24) The NPER

- A) a set of range names.
- B) is a word or a string of characters that represent one or more cells.
- C) is the total number of payment periods.
- D) the present value of the loan.

25) A "Range"

- A) refers to a group of adjacent or contiguous cells.
- B) are the numbers that fall between the smallest and largest in the formula.
- C) is another word for the active worksheet.
- D) cannot be selected with the mouse.

26) The data type "Text" in Excel

- A) includes letters, numbers, and spaces not used in calculations.
- B) is of little concern to Excel because Excel does calculations on numbers.
- C) should be entered into every cell of the spreadsheet.
- D) includes formulas, functions, and formatting.

27) A Formula in Excel (is)

- A) a combination of cell references, operators, values, and/or functions used to perform calculations.
- B) a number that represents a quantity and can be the basis of calculations.
- C) a number that represents a date and can be the basis

of calculations.

D) should be used in each column of a workbook.

28) The PMT function

- A) is the total number of payment periods.
- B) is the periodic interest rate, such as a monthly interest rate.
- C) is the present value of a loan.
- D) calculates the periodic payment for a loan with a fixed interest rate and fixed term.

29) The lookup value

- A) looks in a horizontal table where the first row contains the values.
- B) is a reference to a cell containing a value to look up.
- C) is a range containing a lookup table.
- D) is the argument in a function that identifies which lookup table column from which to return a value.

30) The COUNTA function

- A) tallies the number of cells in a range that are not empty.
- B) displays the current date.
- C) evaluates a condition and returns one value if the condition is true and a different value if the condition is false.
- D) evaluates true or false.

31) The IF function

- A) contains another function embedded inside one or more of its arguments.
- B) contains data for the basis of the lookup and data to be retrieved.
- C) evaluates a condition and returns one value if the condition is true and a different value if the condition is false.
- D) looks up a value and returns a related result from the lookup table.

32) A function is a

- A) list of values and defined names as you enter a spreadsheet.
- B) predefined formula that performs a calculation.
- C) cell reference or a value.
- D) set of rules that govern the structure and components for a formula.

33) The AVERAGE function

- A) identifies the midpoint value in a set of values.
- B) calculates the arithmetic mean of values in a range.
- C) identifies the highest value in a range.
- D) displays the lowest value in a range.

34) A nested function

- A) contains data for the basis of the lookup and data to be retrieved.
- B) contains another function embedded inside one or more of its arguments.
- C) looks up a value and returns a related result from the lookup table.
- D) is the lowest value for a specific category or series in a lookup table.

35) A mixed cell reference

- A) contains both an absolute and a relative cell reference.
- B) contains absolute or relative cell references, but not both.
- C) occurs when a formula directly or indirectly refers to the cell containing the formula.
- D) causes a potential error.

36) A formula in Excel must begin with

- A) a cell's specific location.
- B) both an absolute and a relative cell reference.
- C) a cell's relative location.
- D) an Equals (=) sign.

**SHORT ANSWER.** Write the appropriate option that best completes each statement from Question 37 to 40 in the space below the questions.

37) Match the logical operators to their descriptions:

- |        |                          |
|--------|--------------------------|
| I. =   | A. Less than or equal to |
| II. <  | B. Equal to              |
| III. < | C. Not equal to          |
| IV. >  | D. Less than             |
| V. <=  | E. Greater than          |

I= II= III= IV= V=

38) Match the arithmetic operators in order of precedence:

- |                     |                               |
|---------------------|-------------------------------|
| I. Parentheses      | A. 3rd in order of precedence |
| II. Exponent        | B. 1st in order of precedence |
| III. Multiplication | C. 4th in order of precedence |
| IV. Division        | D. 5th in order of precedence |
| V. Addition         | E. 2nd in order of precedence |

I= II= III= IV= V=

39) Match the names or a variety of features with the type of PowerPoint option:

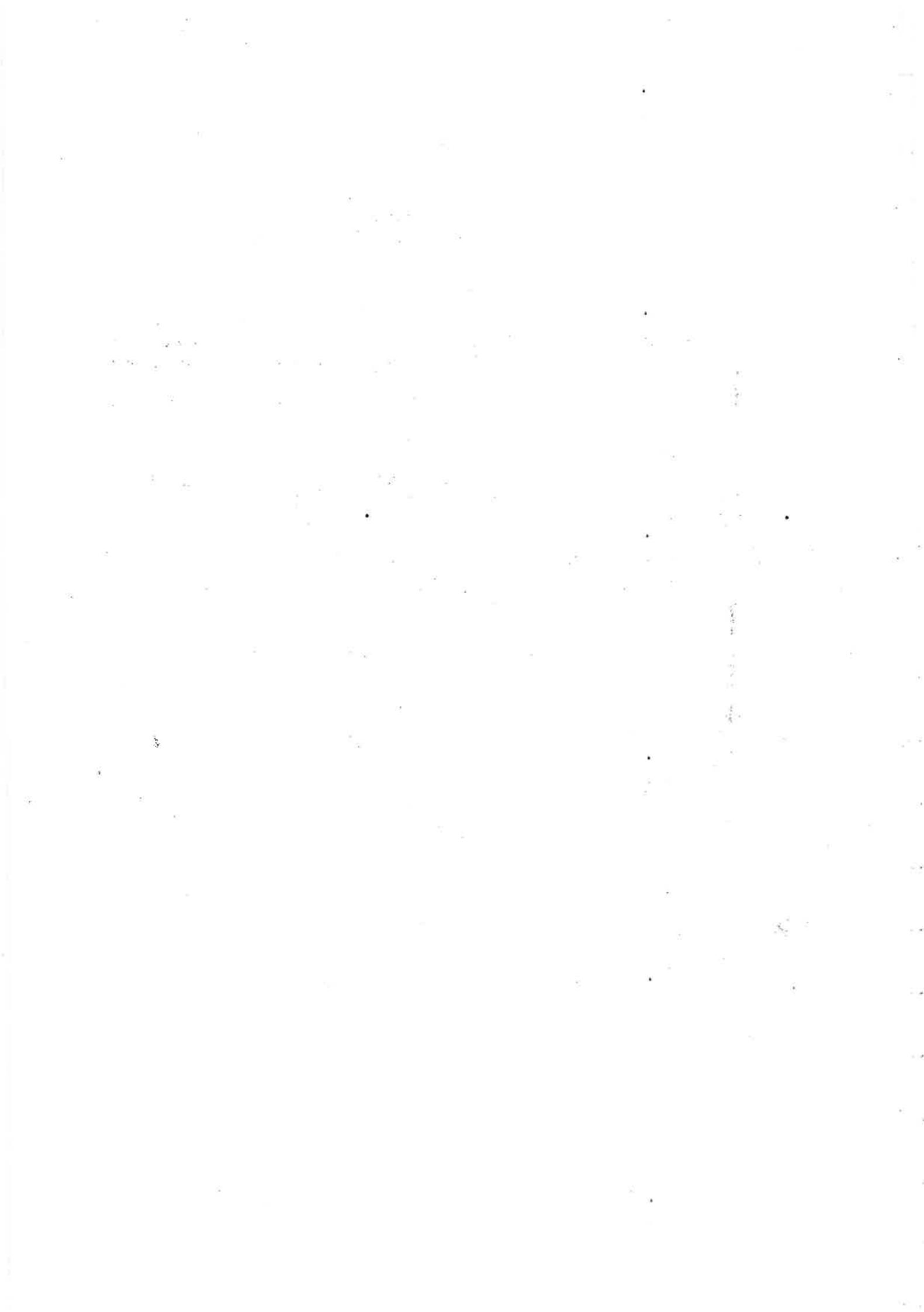
- |                              |                |
|------------------------------|----------------|
| I. Fade, Wipe, Split, Reveal | A. animations  |
| II. Urban, Hardcover, Austin | B. transitions |
| III. Wipe, Fly In, Fade      | C. views       |
| IV. Notes Page, Normal       | D. layouts     |
| V. Blank, Title Only         | E. themes      |

I= II= III= IV= V=

40) Match the type of data that can be entered into a cell with its description:

- |                 |   |
|-----------------|---|
| I. Text         | A. Stored as a "serial" number but can be displayed in varies ways          |
| II. Values      | B. Letters, Numbers, symbols not used in calculations                       |
| III. Dates      | C. Cell references, arithmetic operations, values used in a calculation     |
| IV. Formulas    | D. Numbers that represent a quantity to be used as a basis for calculations |
| V. AutoComplete | E. Displays other labels in that column that match the letters you type     |

I= II= III= IV= V=





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BACHELOR OF SCIENCE ADMINISTRATION  
FIRST SEMESTER EXAMINATIONS, 2018/2019

DEPARTMENT OF ACCOUNTING

ACCT 301: FINANCIAL REPORTING 1 (3 CREDITS)

INSTRUCTIONS: ATTEMPT ALL THE FOUR (4) QUESTIONS  
ROUND OFF ALL DECIMALS [IF ANY] TO THE NEAREST CEDI

TIME ALLOWED: THREE (3) HOURS

**Question 1**

Agona and Jamasi are in partnership sharing profits and losses in the ratio 3:2. They decided to amalgamate their firm with that of another partnership Mampong and Nsuta as at 30th June, 2017. Mampong and Nsuta share profits and losses in the ratio 2:1.

The following were their statement of financial position as at that date:

|                               | Agona &<br>Jamasi<br>GH¢'000 | Mampong &<br>Nsuta<br>GH¢'000 |
|-------------------------------|------------------------------|-------------------------------|
| <b>Non-current assets</b>     |                              |                               |
| Buildings                     | 11,000                       | -                             |
| Plant & equipment             | <u>9,000</u>                 | <u>8,100</u>                  |
|                               | <u>20,000</u>                | <u>8,100</u>                  |
| <b>Current assets</b>         |                              |                               |
| Inventory                     | 8,000                        | 10,080                        |
| Trade receivables             | 5,500                        | 5,040                         |
| Bank                          | <u>6,000</u>                 | -                             |
|                               | <u>19,500</u>                | <u>15,120</u>                 |
| <b>Total assets</b>           | <u><u>39,500</u></u>         | <u><u>23,220</u></u>          |
| <b>Liabilities and equity</b> |                              |                               |
| Trade payables                | 9,500                        | 9,720                         |
| Bank overdraft                | -                            | 2,700                         |
|                               | <u>9,500</u>                 | <u>12,420</u>                 |
| <b>Capital accounts</b>       |                              |                               |
| Agona                         | 20,000                       | -                             |

|                                     |                      |                      |
|-------------------------------------|----------------------|----------------------|
| Jamasi                              | 10,000               |                      |
| Mampong                             |                      | 6,300                |
| Nsuta                               |                      | 4,500                |
|                                     | <u>30,000</u>        | <u>10,800</u>        |
| <b>Total Liabilities and equity</b> | <b><u>39,500</u></b> | <b><u>23,220</u></b> |

**Additional information:**

The terms of the amalgamation which was concluded by 30th June, 2017 were as follows:

- i) Profits and losses were to be shared in the ratio of Agona: Jamasi: Mampong: Nsuta = 2:2:1:1 respectively.
- ii) The values of goodwill of the two firms were agreed to be valued at two year's purchase of the average profits of the last four accounting years (year of amalgamation inclusive). No goodwill account is to be maintained in the books.

Profits of the firms for the past five years ending 30th June are as follows:

| Year                                 | 2017  | 2016 | 2015  | 2014 | 2013 |
|--------------------------------------|-------|------|-------|------|------|
| <b>Agona &amp; Jamasi (GH¢'000)</b>  | 1,050 | 910  | 1,020 | 950  | 800  |
| <b>Mampong &amp; Nsuta (GH¢'000)</b> | 910   | 820  | 670   | 450  | 320  |

- iii) The new firm was to take over all the assets and liabilities of Agona and Jamasi. The following assets of Agona and Jamasi were revalued: buildings GH¢14,400,000; plant and equipment GH¢10,400,000; inventory GH¢8,500,000; trade receivables GH¢5,000,000.
- iv) The new firm was to take over all the assets and liabilities of Mampong and Nsuta at the following agreed values: plant and equipment GH¢9,500,000; inventory GH¢9,900,000; trade receivables GH¢4,900,000.
- v) The capital of the new firm was to be GH¢60,000,000, contributed according to their profit and loss sharing ratio. The balance due to or from the partners will be settled through the bank account of the new firm.

**Required:**

- i) Prepare Realisation account in the books of each of the old firms as at 30th June, 2017. Marks: 10marks
  - ii) Prepare the partners' capital accounts in a columnar form, for the period to 1st July, 2017. Marks: 10marks
  - iii) Prepare the statement of financial position of the new partnership at 1<sup>st</sup> July, 2017 Marks: 10marks
- Total Marks: 30 marks**

## Question 2

- (a) The implementation of International Financial Reporting Standard (IFRS) 16 (replacing International Accounting Standard (IAS) 17 will apply from the beginning of 2019, with the International Accounting Standards Board (IASB) allowing early adoption in 2018.

Required:

Briefly discuss the major differences between IAS 17 and IFRS 16. Marks: 5marks

- (b) The implementation of IFRS15 (replacing IAS11 and 18) will apply from the 1<sup>st</sup> of January, 2018.

18

Required:

Briefly discuss the major differences between IAS 11 and 17 and IFRS 15. Marks: 5marks

- (c) Discuss, with illustrations, the five-step model used in accounting for revenue. Marks: 15marks

Total Marks: 25marks

## Question 3

On 1<sup>st</sup> January, 2018, Daakyehene Co entered into a lease arrangement to acquire a plant under the following terms:

Lease term 5years

Payment terms: 5 annual payments of GH¢ 110,690, payable in advance, with a further payment of GH¢110,690 due at the end of the lease period.

Implicit interest rate 13%

The lease agreement does not include any right of ultimate ownership for Daakyehene Co. However, Daakyehene is responsible for maintenance, insurance and running cost of the asset.

If the asset had been purchased outright at the start of the lease, the cost would have been GH GH¢500,000. The asset has an expected useful life of seven years. The depreciation policy of Daakyehene Co is to fully depreciate non-current assets on a straight-line basis over their useful life.

Required:

- i) Prepare a lease schedule showing the allocation of finance charge over the 5 year period  
Marks: 10marks

- ii) Show the extracts of the income statement and statement of financial position in respect of the relevant years.

Marks: 10marks

**Total Marks: 20marks**

**Question 4**

Ghana Tex-Style Company (GTP) Ltd wishes to expand its production line and have purchased a new packaging line from Kantanka Inc. on hire purchase terms at 1 January 2017. The list price of the packaging line as disclosed by Kantanka Ltd. was GHC54 million. The hire purchase agreement provided that Ghana Tex-Style Company would pay a deposit of GHC9 million on 31st December, 2017 and two annual instalments of GHC26.250 million and GHC24 million on 31st December, 2017 and 2018 respectively and a final instalment of GHC22.641 million on 31st December, 2019. The true rate of interest is 25% per annum

The depreciation policy of GTP is to write off the line to nil value over 10 years on straight line basis. The total cost of manufacturing the line to Kantanka Ltd. was \$43.2 million (the cedi equivalent of GHC21.6 million).

**Required:** Account for the above transaction in the books of GTP Ltd and in the books of Kantanka Ltd for the years 2017; 2018 and 2019 assuming hire-purchase interest account is kept.

**Total Marks: 25marks**



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BACHELOR OF SCIENCE ADMINISTRATION  
FIRST SEMESTER EXAMINATIONS, 2017/2018

DEPARTMENT OF ACCOUNTING

ACCT 301: FINANCIAL REPORTING 1 (3 CREDITS)

INSTRUCTIONS: ATTEMPT ALL THE FOUR (4) QUESTIONS

ROUND OFF ALL DECIMALS [IF ANY] TO THE NEAREST CEDI

TIME ALLOWED: THREE (3) HOURS

Question 1

- (a) Plaintiff Agyenim-Boateng was a partner at Addo and Asafo-Adjei law firm for nearly 30 years. Sometime before 2016, the firm commenced negotiations with Agyenim-Boateng to persuade him to withdraw as a partner. When the talks reached an impasse, Addo and Asafo-Adjei voted to dissolve the partnership and re-form without Agyenim-Boateng, effective 1<sup>st</sup> July, 2016. The partners immediately reconstituted themselves as a new firm using the same name, address, facilities and client list as the dissolved firm.

Agyenim-Boateng commenced action against the partnership in dissolution and successor firm, alleging he was wrongfully terminated. The partnership agreement did not contain an express termination provision.

You are required to:

- I. Discuss whether Agyenim-Boateng was lawfully removed from the partnership business

Marks: 4marks

- II. Discuss ways by which according to the Partnership Act, a partnership can be dissolved.

Marks: 4marks

EXAMINERS: DR. C. AGYENIM-BOATENG, MR. F. O. ASAFO-ADJEI AND MR. A. ADDO



III. Explain the likely actions that the court can ask the new constituted firm to do after the court action.

Marks: 3marks

IV. Is it right for Agyenim-Boateng to ask for the new constituted firm to value its assets in order for him to enjoy the goodwill of the company?

Marks: 3marks

V. Discuss the right procedures that should have been followed by Addo and Asafo-Adjei to dissolve the partnership before forming a new one.

Marks: 3marks

VI. Discuss the differences between purchased goodwill and internally generated goodwill

Marks: 8marks

**Marks: 25marks**

(b) Mercy, Grace and Love have been in partnership business sharing profits and losses 4:3:3 respectively. The accounts of the firm were made up to December 31st each year. The partnership agreement provided that:

- i. interest was to be credited at 10% per annum on capital account balances at the beginning of the year;
- ii. no interest was to be charged on current balances; and
- iii. on the death of a partner:
  1. Goodwill was to be valued at three years' purchase of the simple average profits of the three years prior to the year of death;
  2. The total amount due to a deceased partner was to be left in the business as a loan at an interest at 12% until paid;
  3. Land and buildings and fixtures and fittings were to be valued by an independent valuer. All other assets and liabilities are to be taken at their book values.
  4. Accounts were not to be drawn up to the date of death but the profit or loss of the year in which a partner died was to be apportioned. If a partner dies between 1<sup>st</sup> January and 30<sup>th</sup> June, the apportionment is cut off at 30<sup>th</sup> June. If the date of death is between 1<sup>st</sup> July and 31<sup>st</sup> December, no apportioned is done; a full year's profit is shared among all partners, including the deceased partner.

The balances in the books of the firm as at 31st December, 2016 subject to final adjustments were:

|  | Dr               | Cr               |
|--|------------------|------------------|
|  | GH¢              | GH¢              |
| <b>Partners' Capital Account:</b>            |                  |                  |
| Mercy  |                  | 300,000          |
| Grace  |                  | 150,000          |
| Love   |                  | 180,000          |
| <b>Partners' current Account:</b>            |                  |                  |
| Mercy  | 48,000           |                  |
| Grace  | 72,000           |                  |
| Love   | 72,000           |                  |
| Land and Buildings (NBV)                     | 240,000          |                  |
| Furniture and Fittings (NBV)                 | 45,000           |                  |
| Inventory                                    | 375,000          |                  |
| Trade Receivables                            | 60,000           |                  |
| Bank   | 120,000          |                  |
| Trade Payables                               |                  | 90,000           |
| Profit for the year before charging interest |                  | 312,000          |
| <b>Total</b>                                 | <b>1,032,000</b> | <b>1,032,000</b> |

*Additional information:*

- i. Mercy died on 13<sup>th</sup> September, 2016.
- ii. Profits for earlier years prior to the year of death were:

|      | GH¢    |
|------|--------|
| 2013 | 60,000 |
| 2014 | 62,000 |
| 2015 | 77,800 |

- iii. An independent valuation of the assets at the date of death were:

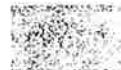
|                       | GH¢     |
|-----------------------|---------|
| Land and buildings    | 300,000 |
| Fixtures and fittings | 30,000  |

- iv. Any adjustment for goodwill was to be made in the capital accounts, but goodwill was not to be maintained as an asset of the firm at December 31st, 2016.
- v. After the death of Mercy, Grace and Love agreed to share profits and losses equally.

**You are required:**

- I. To compute the interest on capitals for the partners for the year ended 31st December, 2016.

Marks: 3marks



- II. To determine the amount of goodwill to be appropriated to the partners before the demise of Mercy. Marks: 4marks
- III. How much is to be credited to Mercy's estate in respect of her capital account and current account balances? Marks: 6marks
- IV. To determine the share of profit for the partners for the year ended 31st December 2016. Marks: 3marks
- V. What is the current account balances for the partners to be stated in the statement of financial position as at 31st December, 2016. Marks: 4marks
- VI. What is the capital account balances for the partners to be stated in the statement of financial position as at 31st December, 2016. Marks: 5marks
- Marks: 25marks

**Total Marks: 50marks**

**Question 2**

- (a) On 1<sup>st</sup> January, 2016, Asona Ltd acquired a land and building lease with a term of 30 years at an annual rental of GH 50,000 payable in advance. Other details of the lease are as follows:

The useful life of the building is 30 years and that of the land is assumed to be indefinite.

The interest rate implicit in the lease was 7.5% and the present value of GH 50,000 per annum payable in advance over 30 years is GH 630,000.

The fair value of the lease hold interest approximates the present value of the minimum lease payment and 10% (ie GH 630,000) is attributable to the land element.

**You are required to:**

Calculate the amounts to be recognized in the entity's Income Statement for the year ended December, 2016 and its Statement of Financial Position as at 31<sup>st</sup> December, 2016.

Marks: 15marks

- (b) Brokeman Ltd has recently been suffering a shortage of cash and to help to alleviate this had sold one of their office buildings to a third party institution on 1<sup>st</sup> January, 2016 and then leased it back for a period of 15 years. The sale price of the building and its fair value



are GHS8.5m which is the present value of the minimum lease payments. At the end of the agreement the building will be transferred back to Brokemen Ltd at nil cost. At 31st December, 2015 the carrying amount of the building was GHS7m. The rental under the lease agreement is GHS0.8m per annum payable in advance on 1st January each year and the interest rate implicit in the lease is 5.44%. The directors of Brokemen Ltd are proposing to include the profit on disposal of GHS1.5m in profit or loss for the year and treat the lease as operating lease.

**You are required to:**

Write a report to the directors of Com4 explaining how the transaction should be dealt with in the financial statement for the year ended 31st December, 2016. Marks: 15marks

**Total Marks: 30marks**

**Question 3**

A-life Energy Ltd wishes to expand its production line and have purchased a new packaging line from B-Engineering Inc. on hire purchase terms on the 1st of January, 2014. The list price of the line as disclosed by B-Engineering Inc. was GH¢54 million. The hire purchase agreement provided that A-life Energy Ltd would pay a deposit of GH¢9 million on 1st January, 2014 and two annual installments of GH¢24 million on 31st December, 2014, 2015 and a final installment of GH¢20.391 million on 31st December, 2016. The true rate of interest is 25% per annum.

The depreciation policy of A-life Energy Ltd is to write off the line to nil value over 10 years on straight line basis. The total cost of manufacturing the line to B-Engineering was GH¢ 43.2 million.

**You are required to:**

Account for the above transaction in the books of A-life Energy Ltd, assuming that:  
Hire-Purchase Interest Account is kept Marks: 10marks

**Total Marks: 10marks**

**Question 4**

Efia AKorama Ltd is negotiating with the local government to build a new bridge after demolishing the existing bridge in downtown near the city center. At the initial meeting, it was indicated that the government would not be willing to pay for both components of the contract an amount exceeding GH¢ 1,000,000. The government representatives insisted that separate proposals would need to be submitted and negotiated and that the contractor should maintain separate records for



each component of the contract and upon request furnish details of the contract costs incurred to date by component. After submission of the separate proposals, it was agreed that the split of the contract price of GH¢ 1,000,000 would be in the ratio of 70% for construction of the new bridge and 30% for demolishing the existing bridge.

You are required to:

Evaluate, in the light of the provision of IAS 11, whether the contract for the construction of the new bridge and the contract for demolishing the existing bridge should be segmented and treated as separate contracts or be combined and treated as a single contract.

Total Marks: 10marks

EXAMINERS: DR. C. AGYENIM-BOATENG, MR. F. O. ASAFO-ADJEI AND MR. A. ADDO





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BACHELOR OF SCIENCE ADMINISTRATION  
FIRST SEMESTER EXAMINATIONS, 2016/2017

DEPARTMENT OF ACCOUNTING

ACCT 301: FINANCIAL REPORTING 1 (3 CREDITS)

**INSTRUCTIONS: ATTEMPT ALL THE FOUR (4) QUESTIONS  
ROUND OFF ALL DECIMALS [IF ANY] TO THE NEAREST CEDI**

**TIME ALLOWED: THREE (3) HOURS**

**Question 1**

Dromo, Shidaa and Junior have been in partnership business since 2005. In 2015, they decided to dissolve their firm due to operational difficulties. The statement of financial position of the firm as at 31st December, 2015 is shown below:

|                            | GH¢            |
|----------------------------|----------------|
| <i>Assets:</i>             |                |
| Investment property        | 80,000         |
| Freehold land and building | 92,000         |
| Plant and equipment        | 212,000        |
| Motor vehicles             | 76,500         |
| Inventory                  | 186,000        |
| Trade receivables          | <u>191,500</u> |
|                            | <u>838,000</u> |

*Capital & Liabilities*

Capital Accounts:

|        |          |
|--------|----------|
| Dromo  | 136,400  |
| Shidaa | 63,700   |
| Junior | (26,200) |

Current Accounts:

|        |         |
|--------|---------|
| Dromo  | 14,000  |
| Shidaa | 9,500   |
| Junior | (3,800) |

|                 |                |
|-----------------|----------------|
| Loan Account:   |                |
| Dromo           | 30,000         |
| Shidaa          | 20,000         |
| Trade payables  | 446,400        |
| Bank overdrafts | <u>148,000</u> |
|                 | <u>838,000</u> |

*Additional information:*

- i. The partnership agreement provides that profits and losses including losses of capital nature shall be shared as follows: Dromo 6: Shidaa 5: Junior 4.
- ii. The partners have agreed to take out as maximum cash as possible as and when assets are realised.
- iii. Dromo and Shidaa took over some vehicles at an agreed valuation of GH¢5,000 each. Junior also took over some computers and accessories at an agreed valuation of GH¢8,000 on 12th January, 2016.
- iv. On 23rd January 2016, the rest of the vehicles were sold for GH¢69,000.
- v. The rest of the plant and equipment were sold for GH¢192,000 on 1st February, 2016. Half of the inventory realised GH¢175,000 on 15th February, 2016. Selling expenses incurred amounted to GH¢7,500.
- vi. The freehold land & building were sold on 20th February, 2016 for GH¢80,000. The investment property realised its fair value of GH¢100,000. Trade payables accepted the amount due them after allowing a discount of 5% on the total amount.
- vii. Trade receivables paid their amounts in full on 25th February, 2016 except Koo Hia, who owed GH¢11,500. He was declared bankrupt on 28th February, 2016.
- viii. The rest of the inventory realised GH¢250,000 on 1st March, 2016.

**You are required to:**

- a) Prepare the bank account and the realisation account. (10 marks)
  - b) Prepare the partners' capital accounts, in columnar form, to close the books of the firm. (10 marks)
- [Total = 20 marks]**

**Question 2**

On 1st January, 2016, Givers Ltd acquired a power generating plant from Tractor & Equipment Ltd on hire purchase. The terms of the hire purchase agreement were that an initial deposit of GH¢80,000 was payable, followed by three instalments of GH¢75,956 on 31st December in each of the next three years from 2016 onwards. The cost of the power generating plant for cash purchase would have been GH¢240,000. Interest is charged on the balance outstanding at 31st December at the rate of 20% per annum. The financial year of both companies ends on 31st December.

**You are required to:**

- a) Determine the amount of hire purchase interest included in the hire purchase price? (2 marks)
- b) What amounts of interest would be allocated to each of the three years if the sum of the years' digits method were used? (3 marks)

- c) Post the Tractor & Equipment Ltd account in Givers Ltd's ledger for 2016, 2017 and 2018 using the 20% per annum interest rate (use either hire purchase interest or interest suspense). (7 marks)
- d) Show an extract from Givers Ltd's income statement and statement of financial position relevant to the hire purchase contract as at 31st December, 2016, 2017 and 2018. (8 marks)

*Note: It is the policy of Givers Ltd to depreciate power generating plants at the rate of 20% per annum on the outstanding balance. The manufacturing cost of the crane was GH¢180,000.*

[Total = 20 marks]

### Question 3

Givers Ltd intends to purchase a new machinery to augment its set of factory plant and equipment. It has two options. It can buy a machinery for cash at a cost of GH¢57,100 or it can lease from the leasing company. The lease primary period is for 4 years from 1st January, 2016 with a rental of GH¢20,000 per annum payable on the 31st December each year. The lessee has the right to continue to lease the asset after end of the primary period for an indefinite period, subject only to a nominal rent. The lessee is required to pay all repair, maintenance and insurance costs as they arise. The interest rate implicit in the lease is 15%. The lessee estimates the useful life of the leased asset to be eight years. Depreciation is provided on a straight line basis.

#### You are required to:

- a) Explain the difference between a finance lease and an operating lease? (3 marks)
- b) Prepare a lease schedule showing the allocation of the finance charge over the four year period. (4 marks)
- c) Show the extracts of the income statement and the statement of financial position in respect of the lease over all relevant years. (16 marks)

[Total = 20 marks]

### Question 4

- a) International Accounting Standards 11 (IAS 11) *Construction Contracts* states that the stage of completion of a contract may be determined in a variety of ways. Depending on the nature of the contract, the entity uses the method that measures reliably the work performed.

#### You are required to:

State the methods that can be used to determine the stage of completion of a contract. (3 marks)

- b) ABC Contractors Ltd is constructing a new multi-purpose office building for Exim Enterprise. The project which is expected to take three years to complete has a fixed contract price of GH¢12,000,000. The details of the costs incurred to date in the first year are:

|   | GH¢            |
|---|----------------|
| Site labour costs                           | 1,000,000      |
| Cost of construction material               | 3,000,000      |
| Depreciation of special plant and equipment | <u>500,000</u> |
| Total                                       | 4,500,000      |

Total additional contract cost estimated to complete GH¢5,500,000

You are required to:

Calculate the percentage of completion and the amounts of revenue, costs, and profits to be recognized in the first year. (8 marks)

- c) Cilla Construction Limited has a contract to construct a major road in Accra. The agreed contract price is GH¢30 million. The following table shows the position of the contract at the end of the years

|   | 2016<br>GH¢'000 | 2017<br>GH¢'000 | 2018<br>GH¢'000 |
|---|-----------------|-----------------|-----------------|
| Cumulative costs incurred to date       | 9,000           | 21,600          | 24,300          |
| Estimated costs yet to be incurred      | 18,000          | 2,400           | -               |
| Progress billings during the year       | 6,000           | 22,200          | 1,800           |
| Received from customers during the year | 4,500           | 18,000          | 7,500           |

The contractor determines stage of completion as the percentage cost incurred to date bears with total estimated cost to complete.

You are required to:

Show the figures to be included in the income statements for the three years ended 31st December, 2016, 2017 and 2018 and in the statement of financial positions as at 31st December, 2016, 2017 and 2018 for this contract, in the books of Cilla Construction Limited, in accordance with IAS 11.

(9 marks)

[Total = 20 marks]



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BACHELOR OF SCIENCE ADMINISTRATION  
FIRST SEMESTER EXAMINATION 2015/2016  
ACCT 301: FINANCIAL REPORTING 13 CREDITS

INSTRUCTION:

ATTEMPT ALL THE FOUR (4) QUESTIONS AND PROVIDE ALL ANSWERS IN THE ANSWER BOOKLET: CLEARLY SHOW WORKINGS FOR EACH QUESTION

TIME ALLOWED: THREE (3) HOURS

ROUND OFF ALL DECIMALS [IF ANY] TO THE NEAREST CEDI

Question 1

Two accountancy firms Desmond, Edith and Jeffery of Accra, and Kobby & Gracey of Kumasi agreed to merge their practices effective 1 January 2015. Both firms balanced their books and made up their accounts to 31 December, 2014. Their statements of financial position are as follows:

|                    | DEJ           | KG            |
|--------------------|---------------|---------------|
|                    | GH¢'000       | GH¢'000       |
| Land and Buildings | 35,000        | Nil           |
| Equipment          | 5,000         | 6,000         |
| Debtors            | 20,000        | 14,000        |
| Work unbilled      | 8,000         | 6,000         |
| Prepayments        | 400           | 200           |
| Bank and Cash      | 2,000         | 3,000         |
|                    | <u>70,400</u> | <u>29,200</u> |
| Capital Account    |               |               |
| Desmond            | 24,000        |               |
| Edith              | 16,000        |               |
| Jeffery            | 13,000        |               |
| Kobby              |               | 16,000        |
| Gracey             |               | 9,000         |
| Current Account    |               |               |
| Desmond            | 1,000         |               |

|                   |               |               |
|-------------------|---------------|---------------|
| Edith             | 600           |               |
| Jeffery           | 300           |               |
| Kobby             |               | 500           |
| Gracey            |               | 400           |
| Loan from Desmond | 10,000        |               |
| Creditors         | 5,000         | 3,000         |
| Accruals          | 500           | 300           |
|                   | <u>70,400</u> | <u>29,200</u> |

The profit/loss sharing ratio of D, E, and J is 2:2:1 respectively and that of K and G is 3:2 respectively. DEJ partnership agreement allows for 10% interest on capital and that of KG allows salaries to partners as to Kobby, GH¢ 5,000 per annum and as to Gracey, GH¢ 4,000 per annum.

The tangible fixed assets of both firms are to be revalued at 1st January, 2015, as follows:

|                    | DEJ<br>GH¢'000 | KG<br>GH¢'000 |
|--------------------|----------------|---------------|
| Land and Buildings | 54,100         |               |
| Equipment          | 6,000          | 8,100         |

The premises of KG are rented and will be given up after the merger. All other identifiable assets will be taken over at book values.

The total value of each of the existing firms at 31st December, 2014 are to be computed at the present values of their projected net earnings for the three years ended 31st December, 2014 (assuming that they are not merged and that there is no inflation), discounted at 15% per annum (assume that earnings are received at year end). The resulting goodwill for dissolving the firms are to be written off by the new firm at 1st January, 2015.

The projected net earnings are:

| Year ending 31st December | DEJ<br>GH¢'000 | KG<br>GH¢'000 |
|---------------------------|----------------|---------------|
| 2012                      | 50,000         | 20,000        |
| 2013                      | 55,000         | 25,000        |
| 2014                      | 22,675         | 17,781        |

The discounting factor at the rate of 15% per annum are as follows  
Year

|   |       |
|---|-------|
| 1 | 0.87  |
| 2 | 0.756 |
| 3 | 0.658 |

Profits/losses are to be shared in the new firm as follows D 25%, E 20%, J 20%, K 20% and G 15%. D's loan is to be recognized as a liability of the new firm.

You are required to:

- i. Prepare the revaluation accounts (4 marks)
- ii. Partners' Capital Account (12 marks)
- iii. Compute Goodwill (12 marks)
- iv. Prepare the opening statement of financial position of the new firm, DEJKG & Co, as at 1st January, 2015. (12 marks)

NB: Show all relevant workings.

Totals: 40 Marks

**Question 2**

- a) Distinguish between a finance lease and an operating lease. (2 Marks)
- b) Give four situations where a lease would be classified as a finance lease (2 Marks)
- c) ABC Company entered into a lease agreement with Quality Machinery Ltd on 1st January 2013, for a new bottle washer plant tagged with the cash price of GH¢ 47,460. The lease requires the payment of an annual rental of GH¢ 13,610 payable in advance. The primary period of the lease is for 4 years after which the lessee has the right to extend the lease indefinitely on the payment of a nominal annual rental. The lessee holds the view that the economic useful life of the plant is four years and depreciates it on the straight line basis (with nil residual value). The lessee has accounting period ended 31st December, and finance charge is accrued at 31st December. Assuming an implicit interest rate of 10%.

Required

- i. Show the allocation of the finance charge using the actuarial method (4 Marks)
- ii. Show the obligation under Finance Lease Account (applying the actuarial method for the finance charge allocation) (4 Marks)
- iii. Show the charges to the Income Statement in respect of the lease over all relevant years (4 Marks)
- iv. Show the statement of financial position extracts for all relevant years. (4 Marks)

Totals: 20 Marks

### Question 3

On 1st July 2013, General Electricals signed a GH¢ 3,000,000 contract to build a new studio for Peace TV. The following information is relevant to this contract:

|   | In 2013<br>GH¢ | In 2014<br>GH¢ |
|---|----------------|----------------|
| Expenditure   |                |                |
| Labour  | 240,000        | 310,000        |
| Materials   | 473,000        | 586,000        |
| Site expenses                                       | 84,500         | 125,000        |
| Hire of plant                                       | 57,500         | 14,000         |
| Plant purchased- 1st July 2013                      | 360,000        |                |
| Progress Payment Invoiced (based on work certified) | 1,000,000      | 2,000,000      |
| Cash received from Peace TV                         | 900,000        | 1,800,000      |

Accrued expenses and inventory of unused materials at 31st December, 2013 amounted to GH¢8,000 and GH¢17,000 respectively. Overheads are allocated between contracts at 10% of labour costs. Plant is depreciated at 25% per annum straight line on cost. A rectification provision of 4% of the contract is set aside at the end of each contract.

The profitable outcome of the contract was apparent on 31st December, 2013. Estimated costs to completion on 31st December were GH¢1,035,000. The contract was completed on 31st August, 2014 and Peace TV paid the 10% retention money on 1st March, 2015. During January, 2015, GH¢100,000 was incurred to rectify construction defects.

The figure for progress payments invoiced is to be taken as the value of work performed for the turnover figure in the income statement. The stage of completion is therefore determined based on the proportion the value of work certified bears with contract price.

**Required:**

- i. Show the necessary ledger entries in the books of General Engineers Ltd (10 Marks)
- ii. Show the income statement for 2013 and 2014 (5 Marks)
- iii. Show the statement of financial position extracts as at 31st December, 2013 and 2014. (5 Marks)

**Totals: 20 Marks**

#### Question 4

Grace Computers is a retail outlet selling desktop computers and on hire purchase terms. The following information has been extracted from the books of account as at 31st December, 2014:

|  | DR<br>GH¢ | CR<br>GH¢ |
|--|-----------|-----------|
| Stated Capital                             |           | 75,000    |
| General Operating expenses                 | 130,000   |           |
| Cash book balance                          | 6,208     |           |
| Cash received from hire purchase customers |           | 315,468   |
| Cash sales                                 |           | 72,000    |
| Hire purchase trade receivable (1/01/14)   | 2,268     |           |
| Plant Property and Equipment at Cost       | 100,000   |           |
| Accumulated depreciation (1/01/14)         |           | 45,000    |
| Income surplus (1/01/2014)                 |           | 7,000     |
| Purchases                                  | 342,000   |           |
| Trade Payables                             |           | 80,000    |
| Inventory (1/01/14)                        | 15,000    |           |
|  | <hr/>     | <hr/>     |
|  | 595,476   | 595,476   |

#### Additional Information

- I. The company's policy is to take credit for gross profit (including interest) for hire purchase sales in the proportion of cash collected. It does this by raising a provision against the profit included in the hire purchase trade receivable not yet due;
- II. The cash selling price is fixed at 50% and the hire purchase selling price at 80% respectively against the cost of goods purchased;
- III. The hire purchase contract requires an initial deposit of 20% of the hire purchase selling price, the balance to be paid in four equal instalments at quarterly intervals. The first instalment is due three months after the agreement is signed;
- IV. Hire purchase sales for the year amounted to GH¢540, 000;
- V. Depreciation on fixed Assets at the rate of 15% per annum on cost.

#### You are required to prepare:

- i. Grace Computer Ltd's income statement for the year to 31st December, 2014 (10 Marks)
- ii. Statement of financial position as at 31st December, 2014 (10 Marks)

Totals: 20 Marks





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BACHELOR OF SCIENCE ADMINISTRATION  
FIRST SEMESTER EXAMINATION 2014/2015  
ACCT 301: FINANCIAL REPORTING 13 CREDITS

ATTEMPT ALL THE FOUR (4) QUESTIONS

TIME ALLOWED: THREE (3) HOURS

ROUND OFF ALL DECIMALS [IF ANY] TO THE NEAREST CEDI

**Question 1**

The partnership of Addo and Boateng (operating under the business name AB & Co) and that of Asafo and Adjei (operating under the business name AA & Co) agreed to amalgamate with effect from 1st July, 2014. A new firm known as ABAA & Co has been established for this purpose. At the close of business on 30th June, 2014, the separate statement of financial positions of the two firms were as follows:

|                                 | AB & Co        | AA & Co        |
|---------------------------------|----------------|----------------|
|                                 | GH¢            | GH¢            |
| <b>Fixed Assets (NBV)</b>       |                |                |
| Business Premises               | 70,000         | 100,000        |
| Machinery                       | -              | 95,000         |
| Motor Vehicles                  | 15,000         | 20,000         |
| Furniture and Equipment         | 46,000         | -              |
| <b>Total Fixed Assets (TFA)</b> | <b>131,000</b> | <b>215,000</b> |

**Current Assets**

|                                   |                |                |
|-----------------------------------|----------------|----------------|
| Stocks                            | 55,000         | 109,000        |
| Debtors                           | 27,000         | 64,000         |
| Bank and Cash                     | 21,000         |                |
| <b>Total Current Assets (TCA)</b> | <b>103,000</b> | <b>173,000</b> |

### **Current Liabilities**

|   |                 |                  |
|---|-----------------|------------------|
| Trade creditors                         | 31,000          | 57,000           |
| Taxation                                | -               | 22,000           |
| Bank overdraft                          | -               | 49,000           |
| <b>Total Current Liabilities (TCL)</b>  | <b>(31,000)</b> | <b>(128,000)</b> |
| <b>Working capital [WC] = (TCA-TCL)</b> | <b>72,000</b>   | <b>45,000</b>    |
| <b>Net Assets Employed (TFA+WC)</b>     | <b>203,000</b>  | <b>260,000</b>   |

Financed By:

#### **Capital Accounts:**

|         |         |
|---------|---------|
| Addo    | 120,000 |
| Boateng | 60,000  |
| Asafo   | 100,000 |
| Adjei   | 100,000 |

#### **Current Accounts**

|         |                |
|---------|----------------|
| Addo    | 10,000         |
| Boateng | 13,000         |
| Asafo   | 40,000         |
| Adjei   | 20,000         |
|         |                |
|         | <b>203,000</b> |
|         | <b>260,000</b> |

Under the terms of the agreement, ABAA & Co acquired all the assets of AB & Co except for bank and cash. This balance was retained by the partners in order to discharge some of the creditors. Boateng paid the remaining creditors from his personal resources. Other assets were taken over at the following values:

|                         | GH¢     |
|-------------------------|---------|
| Business Premises       | 120,000 |
| Machinery               | 9,000   |
| Furniture and Equipment | 40,000  |
| Stocks                  | 50,000  |
| Debtors                 | 27,000  |

Addo and Boateng share profits and losses in accordance with their capital account proportions.

ABAA & Co took over all the assets of AA & Co and also assumed responsibility for discharging all the liabilities. The assets were revalued as follows:

|                   | GH¢     |
|-------------------|---------|
| Business Premises | 200,000 |
| Machinery         | 80,000  |
| Vehicles          | 20,000  |
| Stocks            | 81,000  |
| Debtors           | 61,000  |

For the purpose of the amalgamation, the values of AB & Co and AA & Co are transferred to the new firm, ABAA & Co at GH¢ 273,000 and GH¢ 360,000 respectively. It was further agreed that the initial capital of ABAA & Co was to be GH¢ 800,000 to be contributed equally by the four partners. Addo, Boateng, Asafo and Adjei are to be equal partners in the new firm. The new firm is to recognize all assets and liabilities as revalued for the amalgamation process.

- (a) Make the necessary entries to close the books of AB & Co and AA & Co.
- (b) Make the necessary entries to record the amalgamation in the books of ABAA & Co.
- (c) Ascertain the goodwill amount that arises from the amalgamation
- (d) Draw up the Statement of financial position of ABAA & Co immediately after the amalgamation.

Total Marks: 25marks

## Question 2

Agyenim-Boateng (AB) Ltd started business on 1st January, 2013 mainly to sell TV sets of a standard type (Sharp 21) to civil servants on hire purchase terms. The total amount, including interest payable for each set is GH¢3,000. Customers are expected to pay an initial deposit of GH¢600 followed by twenty four monthly installments of GH¢100 each. AB purchases his inventory from AC Electronics at a unit cost of GH¢2,000. Prices remained unchanged throughout 2013.

The following trial balance was extracted from the books of AB as on 31st December, 2013.

|                               | DR<br>GH¢'000 | CR<br>GH¢' 000 |
|-------------------------------|---------------|----------------|
| Capital                       |               | 2,000          |
| Fixed Assets                  | 200           |                |
| Drawings                      | 80            |                |
| Bank Overdraft                |               | 192            |
| Trade payables                |               | 532            |
| Purchases                     | 3,600         |                |
| Cash collected from customers |               | 1,530          |
| Bank interest                 | 8             |                |
| Wages and salaries            | 256           |                |
| General operating expenses    | 110           |                |
|                               | -----         | -----          |
|                               | 4,254         | 4, 254         |
|                               | -----         | -----          |

### Additional information

For the first year of operation (year ended 31st December, 2013), 1,700 sets were sold. It is the policy of AB to take credit for profits (including interest) in proportion to the cash collected from customers. Fixed assets are depreciated at the rate of 10% on cost.

Required:

Using the provision for unrealized profit method, prepare the Hire Purchase trading account and income statement for the year ended 31st December, 2013 and a statement of financial position as at 31st December, 2013.

Total Marks: 25marks

### Question 3

a) On 1<sup>st</sup> January, 2013, Akyeampomaa Limited entered into a lease agreement to rent a tractor from Akoroma Limited for a six year period after which it will be returned to the lessor and scrapped. The agreement provides for an annual payments of GH¢ 9,210 made in arrears. The market price of equipment on the date of the transaction was GH¢ 43,000. The present value of minimum lease payments amounts to GH¢ 42,000 (discounted at the implicit interest rate of 12.5% per annum).

Akyeampomaa Ltd expects to be in the construction business during the first 5 years of the lease term only but has leased the equipment for 6 years as this is the requirement of the lessor.

Hint: Use sum of years digits approach!

#### Required:

- i. Justify why the above transaction is an operating or finance lease. Marks: 4marks
- ii) Show the relevant extract of the statement of comprehensive income for the period ending 31<sup>st</sup> December, 2013. Marks: 6marks
- iii) Differentiate between a finance and an operating lease. Marks: 3marks

b) Asafo Adjei Limited took a non-cancellable lease contract with a primary term of 5years from 1<sup>st</sup> January, 2009. The rental is GH¢ 25,000 per annum payable in advance. Asafo Adjei Limited has the right to continue to lease the asset after the end of the primary period for as long as it wishes at a nominal rent. In addition, Asafo Adjei Limited is required to pay all the maintenance costs and insurance as they rise.

The leased asset could have been purchased at the start of the lease for GH¢ 104,250. The estimated useful life of the asset is 5 years. Depreciation is to be charged on a straight-line basis with no residual value. The interest rate implicit in the lease is 10%, and the company uses the actuarial method for the allocation of finance charge.

You are required to record the financial effect of the leasing transaction in the financial statements of Asafo Adjei Limited for all relevant years (2009-2013) with respect to:

- i) Statement of comprehensive income(extracts) Marks: 6marks
- ii) Statement of financial position (extracts) Marks: 6marks

Total Marks: 25marks

#### Question 4

On 1st July 2009, General Electricals signed a GH¢3,000,000 contract to build a new studio for Peace TV. The following information is relevant to this contract:

|   | In 2009<br>GH¢ | In 2010<br>GH¢ |
|---|----------------|----------------|
| Expenditure   |                |                |
| Labour  | 240,000        | 310,000        |
| Materials   | 473,000        | 586,000        |
| Site expenses   | 84,500         | 125,000        |
| Hire of plant   | 57,500         | 14,000         |
| Plant purchased- 1st July, 2009                         | 360,000        | -              |
| Progress Payments Invoiced<br>(based on work certified) | 1,000,000      | 2,000,000      |
| Cash Received from Peace TV                             | 900,000        | 1,800          |

- Accrued expenses and inventory of unused materials at 31st December, 2009 amounted to GH¢8,000 and GH¢17,000 respectively.
  - Overheads are allocated between contracts at 10% of labour costs.
  - Plant is depreciated at 25% p.a straight line on cost.
  - a rectification provision of 4% of the contract is set aside at the end of each contract.
- The profitable outcome of the contract was apparent on 31st December, 2009. Estimated costs to completion on 31st December were GH¢1,035,000.
- The contract was completed on 31st August, 2010 and Peace TV paid the 10% retention money on 1st March, 2011. During January, 2011, GH¢100,000 was incurred to rectify construction defects.

The figure for progress payments invoiced is to be taken as the value of work performed for the turnover figure in the income statement. The stage of completion is therefore determined based on the proportion the value of work certified bears with contract price.

#### Required:

Show the necessary ledger entries in the books of General Engineers Ltd and the relevant income statement and statement of financial position extracts as at 31st December, 2009 and 2010.

Total Marks: 25marks



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(CITY CAMPUS)  
B.Sc ADMINISTRATION  
FIRST SEMESTER EXAMINATIONS, 2013/2014  
ACCT 301: FINANCIAL REPORTING 1 (3 CREDITS)

INSTRUCTIONS:

1. Attempt All Four (4) Questions
2. Time Allowed: Three (3) Hours
3. Credit will be awarded for neat presentation and clarity of expression

**Q. 1**

Chief Chewer-On Ltd, a manufacturer of Alomo Bitters, a Ghanaian acclaimed potent aphrodisiac, purchased hi-tech equipment for producing the Alomo stuff on hire purchase on 1st January, 2009, from Master Screwer Ltd. The hire purchase price was GHC 3,618,000. The cash price was GHC 3,000,000. Under the hire purchase agreement, Chief Chewer-On Ltd. was to pay three instalments of GH¢1,206,000 on 31st December of 2009, 2010 and 2011. The rate of interest is 10%.

The equipment is to be depreciated at the rate of 10% straight line on cost.

Required:

- a) Prepare and show the following ledger accounts in the books of Chief Chewer-On Ltd. for the tenure of the facility i.e. 2009, 2010 and 2011
  - i. Master Screwer Ltd Account
  - ii. Provision for Depreciation Account
- b) Show the Income Statement and the Statement of financial position extracts for the relevant years

(25 Marks)

**Q. 2**

Me and You are in partnership sharing profits and losses equally. The trial balance as extracted from their books on 31st December, 1998 is as follows;

|                                      | DR<br>GH¢'m  | CR<br>GH¢'m    |
|--------------------------------------|--------------|----------------|
| Buildings                            | 50,000       |                |
| Fixtures at cost                     | 11,000       |                |
| Provision for depreciation; fixtures |              | 3,300          |
| Debtors                              | 16,243       |                |
| Creditors                            |              | 11,150         |
| Cash at bank                         | 677          |                |
| Stock at 1 Jan 19998                 | 41,979       |                |
| Sales                                |              | 123,650        |
| Purchases                            | 85,416       |                |
| Carriage outwards                    | 1,288        |                |
| Discounts allowed                    | 115          |                |
| Loan interest – Thomas               | 4000         |                |
| Office expenses                      | 2,416        |                |
| Salaries and wages                   | 18,917       |                |
| Bad debt                             | 503          |                |
| Provision for d bad debt             |              | 400            |
| Loan from Thomas                     |              | 40,000         |
| Capital account:                     |              |                |
| Me                                   |              | 35,000         |
| You                                  |              | 29,500         |
| Current Account:                     |              |                |
| Me                                   |              | 1,306          |
| You                                  |              | 298            |
| Drawings:                            |              |                |
| Me                                   | 6,400        |                |
| You                                  | <u>5,650</u> | <u>244,604</u> |
|                                      |              | <u>244,604</u> |

**Additional information;**

- i. Stocks at 31/12/98 - GH¢ 56,340m
- ii. Expenses accrued: Office GH¢ 96m; Wages GH¢ 200m
- iii. Fixtures are to be depreciated at 10% on reducing balance method and buildings at 2% on cost on straight line method.
- iv. Provision of bad debts is to be reduced to GH¢ 320m. Me is entitled to a salary as partner of GH¢ 800m
- v. Interest on drawings: Me - GH¢ 180m; You – GH¢ 120m
- vi. Interest on capital account balance is 10%

**Required:**

Prepare the partnership Trading, Profit and Loss Appropriation Account for the year ended 31<sup>st</sup> December, 1998 and the Statement of financial position at that date.

(28 Marks)

Q. 3

Aban and Bone are in partnership sharing profits and losses in the ratio of 2:1. They agreed to amalgamate their business with that of Hmm as on 31st December 2002. The abridged balance sheets of the two firms as at that date were as follows:

|                     | Aban&Bone Hmm |               | Aban&Bone Hmm |        |
|---------------------|---------------|---------------|---------------|--------|
|                     | GH¢           | GH¢           | GH¢           | GH¢    |
| Capital Account     |               |               | Premises      | 8,000  |
| Aban                | 21,000        |               | Equipment     | 7,000  |
| Bone                | 8,000         |               | Stock         | 17,000 |
| Hmm                 |               | 7,000         | Debtors       | 2,750  |
| Trade creditors     | 9,000         | 4,000         | Bank          | 4,000  |
| Bank overdraft      |               | 3,300         |               |        |
| Bad debts Provision | 750           | 500           |               |        |
|                     | <u>38,750</u> | <u>14,800</u> |               |        |
|                     | <u>38,750</u> | <u>14,800</u> |               |        |

**The terms of amalgamation:**

- Profits and losses were to be shared in the ratio of Aban, Bone and Hmm - 2:1:1
- The values of goodwill of the two firms were agreed at Aban and Bone Gh¢ 12,000; Hmm GH¢ 6,000 ( no account for goodwill was to be opened in the books , but adjusting entries for transactions between the partners were to be made in the partners capital accounts).
- The new firm was to take over all the assets and discharge all liabilities of Aban and Bone, but assets were to be valued as follows: Premises GH¢11,000; Equipment GH¢ 6,250; Stock GH¢18,500; Debtors GH¢ 2,750
- Hmm was to collect his own debts and pay his trade creditors. The new firm was to take over his equipment for GH¢ 5,000 and his stock for GH¢7,500 and to pay his overdraft.
- The capital for the new firm was to be GH¢ 40,000 contributed in the profit and loss sharing ratio. The balance due to be paid in or withdrawn by each partner was to be entered in a current account.

**Required:**

Close the books of the old firm and prepare the opening statement of financial position of the new firm.

(27 Marks)

**Q. 4**

- a) Distinguish between investments in physical assets and financial assets.
- b) Why will one company want to invest in another?
- c) Screw Ltd. purchased 5,000,000 GH¢1 ordinary shares in Puzzy Ltd. on 1st January, 2005 at a cost of GH¢ 7,000,000. On 31<sup>st</sup> May, 2005, Puzzy Ltd made a 1 for 5 rights issue which Screw Ltd sold for 50 pesewas per share. On 30<sup>th</sup> June, 2005, Screw Ltd sold 2,000,000 shares for GH¢ 4,000,000. On 31st December 2005, Puzzy Ltd paid a dividend of 24 pesewas per share.

Required:

- a) Record the above transactions in the books of Screw Ltd.
- b) What is the average cost of the ordinary shares of Puzzy Ltd held by Screw Ltd after the rights issue?
- c) Determine the capital gain made, on the ordinary share transactions during the year under reference.

**(20 Marks)**