

2013 2ND CYCLE BUSINESS MATHEMATICS (SET ONE)

DURATION: 2 HOURS COEFFICIENT 3

Candidates are authorized to use the following;

- Non programmable calculators
- Financial tables

Multiple choice questions

Candidates are required to write down only the question number and the letter of the answer chosen.

1. Given that $P(A \text{ or } B) = \frac{1}{5}$ and $P(A \text{ and } B) = \frac{1}{6}$ find $P(B)$
 A) $\frac{59}{120}$ B) $\frac{19}{240}$ C) $\frac{29}{140}$ D) $\frac{19}{120}$
2. A study of 1000 randomly selected flights of a major airline showed that 755 of the flights arrived on time. What is the probability of a flight arriving on time?
 A) $\frac{49}{200}$ B) $\frac{151}{200}$ C) $\frac{200}{49}$ D) $\frac{200}{151}$
3. Find the probability of answering the two multiple choice questions correctly if random guesses are made. Assume the questions each have 5 choices for the answer. Only one of the choices is correct.
 A) 0.004 B) 0.4 C) 0.02 D) 0.04
4. A card is drawn from a standard deck of 52 playing cards. Find the probability that the card is an ace or a heart
 A) $\frac{7}{52}$ B) $\frac{4}{13}$ C) $\frac{3}{13}$ D) $\frac{2}{13}$
5. Eight guests are invited for dinner. How many ways can they be seated at a dinner table if the table is straight with seats only on one side?
 A) 362880 B) 4.5 C) 4030 D) 5040
6. Which of the following cannot be a probability?
 A) -64 B) 0 C) 0.0001 D) $\frac{\sqrt{6}}{3}$
7. The distribution of master's degrees conferred by the university of Bamenda is listed below i.e. a student majors in only one subject

Major	Maths	English	Engineering	Business	Education
Freq.	216	207	82	172	217

- What is the probability that a randomly selected student with a master's degree major in Business, Education or Engineering?
- A) 0.334 B) 0.527 C) 0.473 D) 0.284
8. A delivery route must include stops at 6 cities. How many different routes are possible?
 A) 6 B) 46.656 C) 64 D) 720
 9. The access code to a house's security system consists of nine digits. How many different codes are available if each digit can be repeated?
 A) 512 B) $1e+09$ C) 387820.489 D) 9
 10. Decide if the events A and B are mutually exclusive, not mutually exclusive. A student is selected at random.
 - a. the student is taking a math course
 - b. The student is a business-course

- c. Not mutually exclusive D) Mutually Exclusive
11. The point at which no profit is made and no losses are incurred is said to be;
A) Fixed cost point B) Contribution Margin C) Break Even Point D) Contribution Rate
12. Cost analysis provides the following information. Fixed cost 20,000frs, variable cost, 30frs per unit, selling price per unit 50frs. Contribution margin is;
A) 20frs B) 80frs C) 16frs D) 26frs
13. (M-1). If you want to multiply a number 7 to matrix
 $B = \begin{pmatrix} 2 & 3 \\ 4 & 1 \end{pmatrix}$ the result is;
A) $\begin{pmatrix} 14 & 3 \\ 28 & 1 \end{pmatrix}$ B) $\begin{pmatrix} 2 & 21 \\ 4 & 7 \end{pmatrix}$ C) $\begin{pmatrix} 14 & 21 \\ 28 & 7 \end{pmatrix}$ D) $\begin{pmatrix} 14 & 28 \\ 21 & 7 \end{pmatrix}$
14. Given list price = 5500frs, Discount = 850frs, net cost price will be:
A) 6350frs B) 550frs C) 5585frs D) 4650frs
15. Convert 50% markup on sale to % markup on cost
A) 50% B) 100% C) 150% D) 200%
16. The unknown value on the proportion: $2:X = 3:9$ is
A) 5 B) 6 C) 7 D) 8
17. John earned 8% profit on investment of 1000frs and in the next deal he has a lost of 8% on the earned amount. The original amount now is:
A) 100frs B) 993.6 C) 1004 D) none of these.
18. Identity matrix is also a _____ matrix
A) Square B) Triangular C) Diagonal D) A and C
19. Nkeh calculated a correlation coefficient of 0.75. Which of the following reflects the best interpretation of this?
A) Weak negative B) Positive C) Strong negative D) Strong Positive
20. If variable cost is 120frs and contribution margin is 30frs. Then sale will be:
A) 1207frs B) 130frs C) 140frs D) 150frs
21. What shall be compound interest earned on 750frs invested at 12% per annum for 8 years?
A) 1875frs B) 750frs C) 1107frs D) none of these.
22. The weight of a group articles are: 95, 103, 105, 110, 104, 112 and 90. The mean deviation is:
A) 102.71 B) 5.8 C) 110 D) 104
23. The average due date of a series of 30 constant annuities of 10,000frs each of the annual compound rate of 10.25%
A) 11 years B) 12.7 years C) 9 years D) 12.07 years
24. Two capital 300,000frs and 200,000frs were invested at 6% and 5% p.a. respectively at compound interest. If these sums were invested on the same day, how long will it take for the future value to first to triple that of the second?
A) 73.24 years B) 45 years C) 52.4 years D) 43.24 years
25. The prices of petroleum products witness the following % increase for the past 5 years
- | Years | 2004 | 2005 | 2006 | 2007 | 2008 |
|------------|------|------|-------|------|------|
| % increase | 6.5% | 8% | 10.5% | 15% | 9% |
- The geometric mean of price increase is
A) 9.8% B) 9% C) 8% D) 9.76%
26. What is the median of 2, 1, 5, 1, 1, 3, 4, 3, 1, 1, 5, 18
A) 2 B) 3 C) 3.5 D) 2.5

27. The standard deviation in Question 26 above is;

- A) 4.75 B) 4.55 C) 3.03 D) 3.75

28. If $P(A/B) = 0.4$ and $P(B) = 0.3$ find $P(A \cap B)$

- A) 0.171 B) 0.525 C) 0.571 D) 0.120

29. What is the expected value of x if the probability distribution is;

X	100	150	200	250	350
P(x)	0.1	0.2	0.3	0.3	0.1

- A) 175 B) 150 C) 205 D) 200

Question 30-33 are base on the information below. An investor just increased his capital and the official values of his shares and subscription rights are as follows for 10 consecutive days in thousand francs

Value of shares (x)	98	94	97	98	100	102	102	104	104	101
Value of subscription right (y)	6.5	5.4	6.3	6.4	6.9	8.1	7.5	7.4	7.4	7.3

30. The mean of X_i is: A) 6.9 B) 100 C) 0.02 D) 94

31. The coefficient of correlation "a" is

- A) 6.9 B) 0.228 C) 0.02 D) 0.864

32. The linear correlation coefficient between variable X_i and Y_i is

- A) 0.228 B) 3.79 C) 0.929 D) 5.64

33. What is "b" A) -15.866 B) +15.866 C) -3.794 D) +3.794

34. A sample of the following data: 1, 13, 14, 19, 23. Using the three standard deviation criterion, the last observation ($x = 23$) would be considered an outlier.

- A) True B) False

35. The Geometric mean of 2, 1, 5, 1, 1, 3, 4, 3, 1, 1, 5, 18 is

- A) 3.75 B) 2.158 C) 1.545 D) 2.376

36. 3 bills of exchange are in geometric progression. Their products is $8\% \cdot 10^{15}$. What is the value of the 1st bill?

- A) 200 000 B) 400 000 C) 500 000 D) 100 000

37. The duration of an investment will be? If the mean invested 200 000frs at 5% compound annually and realized an interest of 81 420frs

- A) 7years B) 8years C) 5years D) 6 years

38. A book seller decide to decrease price by 25% on his books. If the new price is 6,600frs what is the original price?

- A) 8000frs B) 7200frs C) 8800frs D) 8500frs

39. A capital C should be redeemed in 12 constant annuities given that $A_1 + A_2 = 13515.25$ frs and $A_2 + A_3 = 14528.86$ frs. What is the rate of investment?

- A) 5.5% B) 10% C) 7.5% D) 8%

40. If you contracted a loan of 400 000frs from a bank at 5% per prepaid interest for 5 years. The first amortization is;

- A) 88409.6 B) 72390 C) 72010.6 D) 92390