OLABISI ONABANJO UNIVERSITY, AGO-IWOYE

FACULTY OF SOCIAL AND MANAGEMENT SCIENCES

DEPARTMENT OF ACCOUNTING AND BANKING AND FINANCE

2013/2014 HARMATTAN SEMESTER EXAMINATIONS

ACC 305: OPERATIONS RESEARCH I

INSTRUCTIONS: ATTEMPT ALL QUESTIONS IN SECTION A AND QUESTIONS IN SECTION B

TIME ALLOWED: TWO(2) HOURS

SECTION A

MULTIPLE CHOICE QUESTIONS

1. Which one of the following is not a part of operations research methodology?

(a) Utilization of planned approach (b) Adoption of variances to study

(b) Utilization of inter-disciplinary approach

(d) Examination of functional relationship

2. Over-optimization occurs where the benefit cost analysis is _____

(a) positive (b) negative (c) zero (d) one

3. Which one of the following is not a drawback of operations research?

(a) Optimization itself is a problem (b) Changes are difficult to make correctly

(c) Problems are oversimplified and as a result they do not accurately represent real world situation

(d) It is not applicable to non- quantitative problems

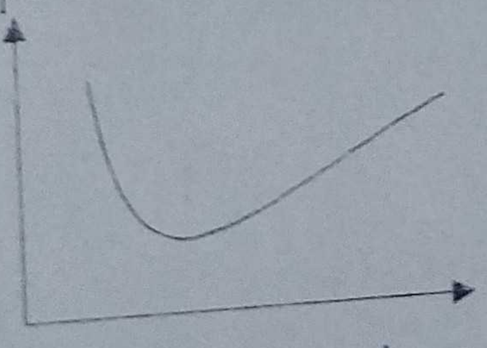
4. Which ONE of the following is NOT a successful area of operations research?

(a) Personnel (b) Accounting and finance (c) Manufacturing (d) Politics

5. The following are the main types of model except _____

(a) iconic models (b) analog models (c) dynamics models (d) symbolic models

6. What type of model is represented by the graph below?



(a) Iconic models (b) analog models

(c) Symbolic model (d) graphical models

7. A model which involves a step-by- step sequential calculations where random numbers are used is called _____

(a) qualitative model (b) quantitative model (c) simulation model (d) deterministic model

8. The non- negativity assumption of linear programming suggests that output must be _____ (a) ≤ 0 (b) ≥ 0 (c) > 0 (d) $=0$

9. The shadow price of a non-binding constraint is _____

(a) ≤ 0 (b) ≥ 0 (c) > 0 (d) $=0$

10. In solving a linear programming problem. there must be _____

(a) At least. two variables irrespective of the number of constraints

(b) At least. one variable irrespective of the number of constraints

(c) Many variables and many constraints

(d) Two variables and many constraints

11. The dual method of determining the shadow price of a constraint is also known as

(a) Declined method (b) increasing the constraint capacity method

(c) lying down method (d) algebraic method

12. Which one of the following is not a feature of linear programming model?

(a) Certainty (b) clear objective (c) reliability (d) continuity

13. The conversion of the original linear programming to the form that is amenable to algebraic computation and manipulation is known as _____

(a) Standard form (b) simplex form (c) objective form (d) dual form

14. The values that are set to zero at each feasible region while using simplex method are called _____ variables

(a) Dummy (b) slack (c) logical (d) basic

15. What is the total contribution with the objective function $=25A = 36B$ and one of the extreme points of the feasible region (X.Y) is found to be (250; 470)

(a) N16.920 (b) 20.750 (c) 20.670 (d) 11.750

16. In the use of simplex method. the initial model is converted to equality state by introducing _____ variable

(a) Minimum (b) slack (c) dummy (d) constraint

17. What is the shadow price of a material constraint. $3X + 2Y \leq 3500$ if total contribution is N12.500? (a) N17.86 (b) 35.70 (c) 3.57 (d) 1.79

18. The area within which an optimal solution could be possibly ascertained is known as

(a) Solution area (b) feasibility region (c) bounded area (d) feasible region

19. The following except _____ is inevitable with carrying unnecessary large stock (a) Occurrence of pilferage (b) reduction in sales price

(c) lying down of capital (d) occurrence of the theft

20. The following are examples of carrying cost of stocks except _____.

(a) Transportation cost (b) cost of pilferage, deterioration etc (c) rent

(d) insurance cost

21. What is the discount rate for EOQ to hold? (a) 0% (b) 1% (c) 2% (d) 3%

Use the following information to answer questions

Oluaye Nigeria Limited uses a component with a quarterly demand of 200 units. Each of these costs N25. Cost per order is N15 while handling cost of stock is 15% of the cost of each components.

22. What is the total controllable cost? (a) N350 (b) N300 (c) 20.300 (d) N150

23. What is the total cost of the order? (a) N350 (b) N20.000 (c) 20.300 (d) N200.350

24. What is the number of order per annum assuming 320 days in the year?

(a) 10.5 units (b) 10.5 times (c) 10units (d) 10 times

25. What is the length of inventory assuming also that there are 320days in the year?

(a) 32 days (b) 32 units (c) 80 days (d) 80 units

26. Which of the following is not a potential benefit of a good JIT system?

(a) Reduced manufacturing lead-time (b) improved labour productivity

(c) price reduction on purchased material (d) reduction in stock holding costs

27. The use of _____ numbers is associated with the mante carlo type of simulation

(a) Randomized (b) random (c) targeted (d) varied

28. What is the number of digit that is applicable to the use of percentage on allocating tag numbers to variables? (a) 1 (b) 2

(c) digit depends on the spread of the given random numbers

(d) digit depends on the availability of the tag numbers

Use the following information to answer questions 29-30

Demand	10		20		30		40		50	
Frequency	21		18		30		20		11	
Tag numbers	2	9	6	0	5	1	1	3	5	0	4	2
	7	8	4	2	5	2	2	4	6	1	8	

29. What is the demand in day 7? (a) 20 units (b) 40 units (c) 30 units (d) 50 units

30. What is the total demand to the seventh day?

(a) 190 units (b) 50 units (c) 95 units (d) 40 units

31. What is the expected useful life of 100 bulbs with the following information?

Month	1	2	3	4
Cumulative probability	20	50	60	100

(a) 2.57 months (b) 2.5 months (c) 2.75 months (d) 2.7 months

32. What is the number of failure in the third month if using mixed replacement strategy?

(a) 20 bulbs (b) 32 bulbs (c) 22.4 bulbs (d) 56.08 bulbs

33. The use of mixed replacement strategy is associated with _____

(a) Assets that fail suddenly (b) assets that fail gradually

(c) assets that fail in an identical way (d) assets that do not fail identically

SECTION B: Attempt All Questions

Q1. ADRAO PLC is considering introducing a new plant. Details of the project are as follows:

Production of the firm's product will require the purchase and installation of new plant and machinery at a cost of ₦ 750.000 payable now. This plant will have a useful life of 6 years. It will have no scrap value at the end of the whole period. Sales are expected to be ₦ 1.200.000 per annum over the next 6 years. Production costs are expected to be ₦ 960.000 per annum. The company's accepted cut-off rate is 12%.

You are required to

(a) Calculate the project net present value

(b) For each of the estimates listed below, determine the change in the individual estimate, which will lead to the project just breaking even in present value terms.

(i) Sales per annum (ii) Useful life of the plant and machinery

(iii) Production cost per annum (iv) Cut-off rate

(v) Initial cost (vi) Contribution.