AAG-010-001610   Seat No. _____

B. B. A. (Sem. VI) (CBCS) Examination

March / April – 2016

610 : Operation Research-II

(New Course)

Faculty Code : 0010

Subject Code : 001610

Time : $2\frac{1}{2}$ Hours]   [Total Marks : **70**

Instructions : (1)   Q. No. 1 is M.C.Q. carrying 20 marks.

(2)   Q. No. 2 to 6 each carry 10 marks.

(3)   Attempt all questions in the same answer book.

1   M.C.Q.   **20**

(1)   OR approach is typically based on the use of _____ model.

(A)   Mathematical   (B)   Physical

(C)   Iconoic   (D)   Descriptive

(2)   A physical model is example of _____ model.

(A)   an iconic   (B)   an analogue

(C)   a verbal   (D)   a mathematical

(3) Operation research analysts does not

    (A) Build more than one model

    (B) Predict future operations

    (C) Recommend decision and accept

    (D) Collect relevant data

(4) Every mathematical model

    (A) must be deterministic

    (B) represents data in numerical form

    (C) requires computer aid for its solution

    (D) all of the above

(5) The minimum processing time on machine M_1 and M_2 related as

    (A) Min t_{1j} = Max t_{2j}

    (B) Min t_{1j} ≤ max t_{2j}

    (C) Min t_{1j} ≥ max t_{2j}

    (D) Min t_{2j} ≥ max t_{1j}

(6) Total elapsed time to process all jobs through two machines is given by

    (A) $\sum_{j=1}^{n} M_{1j} + \sum_{j=1}^{n} M_{2j}$ (B) $\sum_{j=1}^{n} M_{1j} + \sum_{j=1}^{n} M_{1j}$

    (C) $\sum_{j=1}^{n} M_{2j} + \sum_{j=1}^{n} M_{2j}$ (D) None of the above

(7) If there are n jobs to be performed, one at a time, on each of m machines, the possible sequences would be

(A) $(m!)^n$

(B) $(m)^n$

(C) $(n)^m$

(D) $(n!)^m$

(8) You would like to assign operators to the equipment that has

(A) job which has been waiting longest

(B) job with the earliest due date

(C) most jobs waiting to be processed

(D) all of the above

(9) If r is the interest rate, then the present value of one rupee spent in n years is given by pwf = _____.

(A) $(1+r)^{-n}$

(B) $(1+r)^n$

(C) $(1-r)^n$

(D) $(1-r)^{-n}$

(10) The group replacement policy is suitable for identical low cost items which are likely to fail

(A) Suddenly

(B) Over a period of time

(C) Completely and suddenly

(D) None of the above

(11) The problem of replacement is felt when job performing units fail.

(A) Suddenly

(B) Gradually

(C) Both (A) and (B)

(D) None of the above

(12) The sudden failure among items is seen as

(A) Progressive   (B) Retrogressive

(C) Random   (D) All of te above

(13) If an activity has zero slack, it implies that

(A) It lies on the critical path

(B) It is a dummy activity

(C) The project is progressing well

(D) None of the above

(14) In PERT the span of time between the optimistic and pessimistic time estimates of an activity is

(A) 6σ (B) 3σ

(C) 12σ (D) None of the above

(15) The slack for an activity is equal to

(A) LF – LS   (B) LS – ES

(C) EF – ES   (D) None of the above

(16) The object of the network analysis is to

(A) Minimize total project cost

(B) Minimize total project duration

(C) Minimize production delays interruption and conflicts

(D) All of the above

(17) If EOQ is calculated, but an order is then placed which is smaller than this, will the variable cost

(A) increase

(B) decrease

(C) no change

(D) either increase or decrease

(18) The basic reorder point policy is _____ policy.

(A) (T, s, S)   (B) (s, T)

(C) (s, Q)   (D) None of the above

(19) Which cost can vary with order quantity ?

(A) unit cost only   (B) recorder cost only

(C) holding cost only   (D) all of these

(20) Operating decisions in an inventory system are concerned with

(A) order quantity

(B) reorder level

(C) customer service level

(D) all of the above

2   What is Operation Research ? State its characteristics.   **10**

OR

2   Explain methodology of O.R.   **10**

3 Write note on critical path method. Also discuss its advantages and disadvantages. **10**

OR

3 A small project, consisting of eight activities has the following characteristics : **10**

Activity	Preceding Activity	Time estimate (in weeks)		
		t_o	t_m	t_p
A	–	2	4	12
B	–	10	12	26
C	A	8	9	10
D	A	10	15	20
E	A	7	7.5	11
F	B,C	9	9	9
G	D	3	3.5	7
H	E,F,G	5	5	5

(i) Draw the PERT network for the project

(ii) Determine the critical path

(iii) If a 30 week deadline is imposed what is the prob. that the project will be finished within the time limit ?

4 Discuss the algorithm for processing n jobs through two machines. **10**

OR

4   Determine the optimal sequence of jobs that minimize   **10**
the total elapsed time based on the following information.
The processing time on machine is given in hours and
passing is not allowed. Also calculate idle time on each
machine.

	Job	J_1	J_2	J_3	J_4	J_5
	A :	16	20	12	14	22
Machines	B :	10	12	4	6	8
	C :	8	18	16	12	10

5   What is replacement problem ? Describe important   **10**
replacement situations and policies. Also explain various
types of failures.

OR

5   The cost price of a machine is Rs. 5,000. Its maintenance   **10**
cost and the scrap value at the end of each year is given
as follows : When should the machine be replaced ?

Year	1	2	3	4	5	6	7	8
Maintenance Cost (in Rs.)	1500	1600	1800	2100	2500	2900	3400	4000
Scrap value (in Rs.)	3500	2500	1700	1200	800	500	500	500

6 What is inventory control ? Explain different costs **10**
associated with any inventory system.

OR

6 A retail store has a domestic item with annual demand **10**
2500 units. Set up cost is Rs. 40.50 per order, the unit cost
is Rs. 160 and there is 10% inventory carrying charge for
the item.

Find :

(1) Economic Order Quantity

(2) Number of orders per year

(3) Time between two consecutive orders

(4) Minimum total cost.

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