

1.

Hospital Operations Management approach is _____ .

- (A) multi-disciplinary
- (B) subjective
- (C) intuitive
- (D) collect essential data

Correct Option(s): A

2. Hospital Operations Management has its roots in the theories of:

- (A) Human Relations Management
- (B) Organizational Behaviour
- (C) Bureaucratic Management
- (D) Scientific management

Correct Option(s): D

3. Hospital Projects can be viewed as

- (A) Temporary endeavours undertaken to create new products and services
- (B) Permanent endeavours undertaken to create new products and services
- (C) Repetitive endeavours undertaken to create new products and services
- (D) None of the given options

Correct Option(s): A

4. The "father" of scientific management is

- (A) Michael Schumacher
- (B) Frederick W. Taylor
- (C) Henry Ford
- (D) Eli Whitney

Correct Option(s): B

5. _____ are used to represent activity in a network diagram

- (A) Circles
- (B) Squares
- (C) Rectangles
- (D) Arrows

Correct Option(s): D

6. The useful methodologies available for planning and scheduling the projects include

- (A) Gantt chart
- (B) Program Evaluation and Review Technique (PERT)
- (C) Critical Path Method (CPM)
- (D) All of the given options

Correct Option(s): D

7. The shortest possible time in which an activity can be achieved under ideal circumstances is known as _____

- (A) Pessimistic time estimate
- (B) Optimistic time estimate
- (C) Expected time estimate
- (D) The most likely time estimate

Correct Option(s): B

8. Which of the following statement is correct

- (A) PERT is deterministic
- (B) CPM is probabilistic
- (C) PERT is probabilistic
- (D) None of the given options

Correct Option(s): C

9. In a network diagram, a dummy activity is shown by

- (A) arrow
- (B) dotted arrow
- (C) circle
- (D) None of the given options

Correct Option(s): B

10. If D is the duration, ES and EF are earliest start and earliest finish times, LS and LF are latest start and latest finish times, then the following relation holds good

- (A) $EF = ES + D$
- (B) $LS = LF - D$
- (C) $LF = LS + D$
- (D) All of the given options

Correct Option(s): D

11. In time computations of the project, total float of an activity could be determined by

- (A) Latest Start – Earliest Start of an activity
- (B) Latest Finish – Earliest Finish of an activity
- (C) Both the given options

(D) None of the given options

Correct Option(s): C

12. Float or slack of an activity is

(A) The amount with which a non-critical activity could be rescheduled without increasing the project duration

(B) The amount with which a critical activity could be rescheduled without increasing the project duration

(C) The amount with which a critical activity could be rescheduled with increasing the project duration

(D) None of the given options

Correct Option(s): A

13. The activities with zero float are called as

(A) Critical activities

(B) Non-Critical activities

(C) Dummy activities

(D) None of the given options

Correct Option(s): A

14.

Which of the following is **NOT** among the three time estimates in PERT analysis

(A) Optimistic Time

(B) Pessimistic Time

(C) Shortest Time

(D) Most Likely Time

Correct Option(s): C

15.

In PERT probability analysis, the probability of project completing at schedule time equal to expected duration

(A) 45%

(B) 50%

(C) 90%

(D) 95%

Correct Option(s): B

16.

Based on the list of activities below which of the following can be said?

Activity	Immediate Predecessors
A	----
B	----
C	A, B
D	C

- (A) Activity D cannot begin until C is complete.
- (B) Activity B can begin as soon as activity A is complete
- (C) Activity C can begin as soon as both activities A and B are complete
- (D) All of the given options

Correct Option(s): D

17. The three time estimates for an activity are 3, 4 and 8. The expected time is

- (A) 3
- (B) 4.5
- (C) 6.5
- (D) 8

Correct Option(s): B

18. The critical path of a network represents

- (A) the minimum time required for completion of project
- (B) the maximum time required for completion of project
- (C) maximum cost required for completion of project
- (D) minimum cost required for completion of project

Correct Option(s): A

19. In project cost analysis, the total cost of the project include

- (A) Direct Activities Cost
- (B) Indirect Cost
- (C) Both the given options
- (D) None of the given options

Correct Option(s): C

20. In probabilistic PERT network, if $z = 1.5$, std. dev of critical path is 1, expected project completion time is 40 weeks, then schedule time of completion of the project is:

- (A) 41.5 weeks
- (B) 40.5 weeks
- (C) 39.5 weeks
- (D) 38.5 weeks

Correct Option(s): A

21. If the optimistic, most likely and pessimistic time estimate are 18, 20, 22 then expected time is:

- (A) 18
- (B) 20
- (C) 22
- (D) 24

Correct Option(s): B

22. The objective of carrying out crashing in project management is

- (A) Reduce the direct activities cost
- (B) Reduce the total cost of the project
- (C) Reduce the indirect costs of the project
- (D) None of the given options

Correct Option(s): B

23. The important resource optimization techniques in project management include

- (A) Resource Leveling
- (B) Resource Smoothing
- (C) Both the given options
- (D) None of the given options

Correct Option(s): C

24. Which of the following software could be used in project management analysis

- (A) QM for windows
- (B) MS Excel
- (C) MS Project
- (D) All of the given options

Correct Option(s): D

25. Critical Path Net Work helps a manager

- (A) to concentrate his attention on critical activities
- (B) to divert the resources from non-critical advanced activities to critical activities
- (C) to be cautious for avoiding any delay in the critical activities to avoid delay of the whole project
- (D) All of the given options

Correct Option(s): D

26. Dummy activity on a PERT/CPM chart means, it

- (A) consumes time, but no resources
- (B) consumes resources but no time

(C) consumes neither time nor resources

(D) consumes both resources and time

Correct Option(s): C

27. PERT is

(A) an analytic tool in concept

(B) used for research and development projects

(C) based on three time estimates for activities

(D) All of the given options

Correct Option(s): D

28. Expected time in PERT time computations is calculated by using the formula (using three time estimates):

(A) $(t_o + t_p + t_m)/3$

(B) $(t_o + 4t_m + t_p)/6$

(C) $(4t_o + t_p + t_m)/3$

(D) $(t_o + 4t_p + t_m)/3$

Correct Option(s): B

29. Pessimistic time is

(A) the maximum time which an activity might require

(B) the average time required for a job

(C) the most probable time considering all conditions

(D) the minimum time in which an activity can possibly be accomplished

Correct Option(s): A

30. The three time estimates for an activity are 2, 3 and 10. The expected time is

(A) 3

(B) 4

(C) 5

(D) 6

Correct Option(s): B

31. In PERT analysis, critical path is obtained by joining events having

(A) positive slack

(B) negative slack

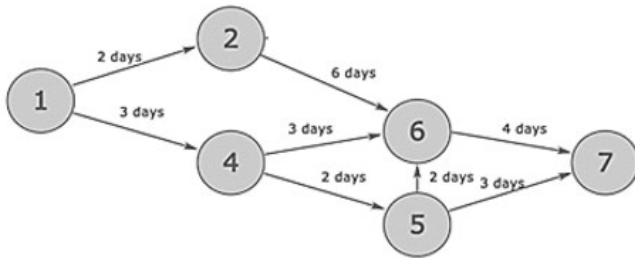
(C) zero slack

(D) None of the given options

Correct Option(s): C

32.

The project duration (length of critical path) in the network diagram below is:



- (A) 10 days
- (B) 11 days
- (C) 12 days
- (D) 14 days

Correct Option(s): C

33. Activities A, B, and C are the immediate predecessors for D activity. If the earliest finish times for the three activities are 12, 15, and 10, then the earliest start time for D will be

- (A) 10
- (B) 15
- (C) 12
- (D) Cannot be determined

Correct Option(s): B

34. Linear programming (LP) is an excellent tool in optimal

- (A) Resource allocation
- (B) Service mix
- (C) Scheduling & assignment
- (D) All of the given options

Correct Option(s): D

35. The structure of LP include

- (A) Decision variables
- (B) Objective function
- (C) Both the given options
- (D) None of the given options

Correct Option(s): C

36. Decision variables

- (A) Tell how much or how many of something to produce, invest, purchase, hire, etc.
- (B) Represent the values of the constraints
- (C) Measure the objective function

(D) Must exist for each constraint

Correct Option(s): A

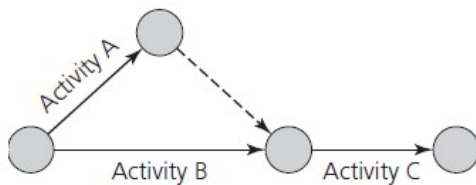
37. The graphical solution method is used for solving linear programming model with how many decision variables

- (A) 3
- (B) 4
- (C) 2
- (D) 1

Correct Option(s): C

38.

In the network diagram, the dotted arrow signifies:



- (A) Activity
- (B) Event
- (C) Dummy Activity
- (D) None of the given options

Correct Option(s): C

39. In inventory management, length of an order cycle is:

- (A) length of a time between orders
- (B) order frequency
- (C) Both the given options
- (D) None of the given options

Correct Option(s): C

40.

Consider the following linear programming in answering the question. The number of decision variables are:

Maximize

$$Z = 1,600 x_1 + 3,000 x_2$$

Subject to:

$$40 x_1 + 25 x_2 \leq 80,000 \text{ (constraint1)}$$

$$20 x_1 + 30 x_2 \leq 60,000 \text{ (constraint2)}$$

$$x_1, x_2 \geq 0 \text{ (non-negativity constraints)}$$

- (A) 2
- (B) 3

(C) 4

(D) None of the given options

Correct Option(s): A

41. The objective function for a L.P model is : $Z = 3x_1 + 4x_2$, If $x_1 = 20$ and $x_2 = 30$, what is the value of the objective function?

(A) 60

(B) 80

(C) 120

(D) 180

Correct Option(s): D

42. LP 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 lowest point of the feasible region

(D) None of the given options

Correct Option(s): B

43.

The linear function of the variables which is to be maximize or minimize is called

(A) Constraints

(B) Objective function

(C) Decision variable

(D) None of the given options

Correct Option(s): B

44. Unboundedness in maximization LP problem is the sign that the the LP

(A) has finite multiple solutions

(B) contains too many redundant constraints

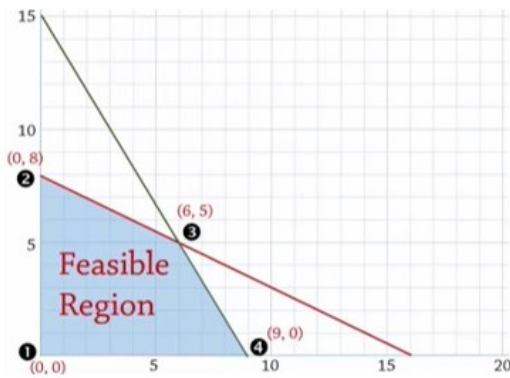
(C) has been formulated improperly

(D) None of the given options

Correct Option(s): C

45.

Feasible region (shaded) for a LPP is shown in figure The objective function is Maximize $Z = 2x_1 + 5x_2$, The point at which the objective function is maximized is :



- (A) (0, 8)
- (B) (6,5)
- (C) (9,0)
- (D) (0,0)

Correct Option(s): A

46. Japanese 5S methodology is created and used for:

- (A) Continuous Improvement
- (B) Prevent Defects
- (C) Creating a productive work environment
- (D) Reduce Variation

Correct Option(s): C

47. If demand is 106 during January, 120 in February, 134 in March, and 142 in April, what is the 3-month simple moving average for May?

- (A) 132
- (B) 126
- (C) 142
- (D) 138

Correct Option(s): A

48. The X Bar R Chart uses two control charts to monitor a process. What are they?

- (A) Mean and Standard Deviation
- (B) Mean and Range
- (C) Mean and Variance
- (D) Grand Average and Variance

Correct Option(s): B

49. In lean, which term refers to a signaling device?

- (A) Muda
- (B) Kaizen
- (C) Poka-yoke
- (D) Kanban

Correct Option(s): D

50. Forecast error equals to

- (A) Forecast value – Actual value
- (B) Actual value – Forecast value
- (C) Both the given options
- (D) None of the given options

Correct Option(s): B

51. In error analysis in forecasting, what would be the MAD for forecast errors of +4, -2, +1, -1?

- (A) 0
- (B) 0.5
- (C) 1
- (D) 2

Correct Option(s): D

52. Healthcare facility location decision fall under:

- (A) Tactical
- (B) Strategic
- (C) Contingency
- (D) None of the given options

Correct Option(s): B

53.

Which of the following is **NOT** a method which is used in location analysis?

- (A) cost - profit - volume method
- (B) factor rating method
- (C) best location method
- (D) center - of - gravity method

Correct Option(s): C

54.

The Systematic Layout Planning (SLP) used in design of process layout was developed by

- (A) Walter Shewart

- (B) J. Juran
- (C) Erward Deming
- (D) Richard Muther

Correct Option(s): D

55. If the objective function in the LPP is $Z = 12x_1 + 6x_2$, then Z value at (50, 15) is :

- (A) 600
- (B) 690
- (C) 680
- (D) None of the given options

Correct Option(s): B

56. Slack value in LPP can come in less-than-or-equal constraint which means:

- (A) unused resource
- (B) surplus resource
- (C) no resource left
- (D) None of the given options

Correct Option(s): A

57. The method used when site alternatives have to be evaluated on attributes other than costs (money) is

- (A) cost - profit - volume method
- (B) factor rating method
- (C) GIS
- (D) center - of - gravity method

Correct Option(s): B

58.

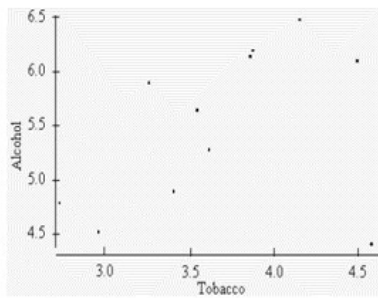
What is **NOT** the purpose of implementing Six Sigma?

- (A) To satisfy customer
- (B) To save cost
- (C) To increase variation
- (D) To reduce defects

Correct Option(s): C

59.

The diagram below is an example of a



- (A) histogram illustrating a lack of correlation between tobacco and alcohol
- (B) scatterplot illustrating a perfect correlation between tobacco and alcohol
- (C) scatterplot illustrating a positive correlation between tobacco and alcohol
- (D) histogram illustrating a positive correlation between tobacco and alcohol

Correct Option(s): C

60. If the lead time is 2 weeks and the weekly consumption is 1000 units, then buffer stock is :

- (A) 2000
- (B) 1000
- (C) 1500
- (D) 3000

Correct Option(s): A

61. A hospital uses 25,000 disposable syringes a year at a cost of Rs.5 each. Order costs have been estimated to be Rs. 500 per order and inventory holding cost is estimated at 20% of the cost of a component per year. What is the EOQ?

- (A) 2500
- (B) 5000
- (C) 10000
- (D) 15000

Correct Option(s): B

62. If for a product EOQ is 10000, and yearly demand is 40000, then length of order cycle is :

- (A) 0.25 or every three months
- (B) 0.5 or every six months
- (C) 1.00 or once in an year
- (D) None of the given options

Correct Option(s): A

63. Spectrum, an analytical tool developed by Avenir Health for population projections consist of following modules:

- (A) DemProj: Demography
- (B) FamPlan: Family Planning

(C) LiST: Lives Saved Tool (Child Survival)

(D) All of the given options

Correct Option(s): D

64. In a hospital, product layout could be found in

(A) an operating room

(B) cafeteria, labs

(C) intensive care, nursing units, administration

(D) None of the given options

Correct Option(s): B

65. Holding or carrying cost in inventory management is

(A) time and effort spent to prepare invoices, inspect goods upon arrival for quality and quantity, and move goods to temporary storage, etc

(B) interest on the money borrowed to buy the items, insurance, warehousing, security, obsolescence, outdated medications, deterioration, spoilage, pilferage, theft, and depreciation

(C) opportunity cost of losing a customer or goodwill, and the risk of lawsuits

(D) None of the given options

Correct Option(s): B

66. Effective inventory management requires knowledge of

(A) Demand & Lead time

(B) Holding & Ordering costs

(C) Classification system

(D) All of the given options

Correct Option(s): D

67. The time period between placing an order and its receipt in stock is known as

(A) Lead time

(B) Carrying time

(C) Shortage time

(D) Over time

Correct Option(s): A

68. In Operating Room, the type of layout preferred is :

(A) Fixed position layout

(B) Process layout

(C) Product layout

(D) None of the given options

Correct Option(s): A

69. Re-ordering point (ROP) is calculated as

- (A) consumption rate x lead time
- (B) demand x lead time
- (C) order quantity x lead time
- (D) None of the given options

Correct Option(s): A

70.

The Economic Order Quantity (EOQ) is calculated as:

where, D=Demand (units), S=Cost per order, H=Holding cost per unit

- (A) $\text{Sqrt}(2D \cdot S/H)$
- (B) $\text{Sqrt}(D \cdot S/H)$
- (C) $\text{Sqrt}(D \cdot S/2H)$
- (D) $\text{Sqrt}(D \cdot S/3H)$

Correct Option(s): A

71. The order cost per order of an inventory is Rs. 400 with an annual carrying cost of Rs. 10 per unit. The Economic Order Quantity (EOQ) for an annual demand of 2000 units is

- (A) 400
- (B) 200
- (C) 440
- (D) 100

Correct Option(s): A

72. ABC analysis divides on-hand inventory into three classes based upon:

- (A) unit cost
- (B) annual monetary values
- (C) number of units on hand
- (D) annual demand

Correct Option(s): B

73. If average demand for an item is 21 units per day, safety stock is 8 units, and lead time is 2 days, the ROP will be:

- (A) 42
- (B) 46
- (C) 50
- (D) 54

Correct Option(s): C

74.

In an A-B-C system, A items typically represent about this percentage of items

- (A) 90%
- (B) 75%
- (C) 50%
- (D) 20%

Correct Option(s): D

75. Receiving a required inventory item at the exact time needed means

- (A) ABC
- (B) JIT
- (C) FOB
- (D) PERT

Correct Option(s): B

76. EOQ is the order quantity that _____ over our planning horizon

- (A) minimizes total ordering costs
- (B) minimizes total carrying costs
- (C) minimizes total inventory costs
- (D) the required safety stock

Correct Option(s): C

77. If the order quantity (size of order) is increased, _____

- (A) holding costs decrease and ordering costs increase
- (B) holding costs increase and ordering costs decrease
- (C) the total costs increase and then decrease
- (D) storage cost as well as stock-out cost increase

Correct Option(s): B

78. Control chart is a

- (A) Process monitoring tool
- (B) Process control tool
- (C) Both the given options
- (D) None of the given options

Correct Option(s): C

79. Which of the following is for food safety management?

- (A) ISO 9001:2008
- (B) ISO 14000

- (C) ISO 22000 – HACCP
- (D) None of the given options

Correct Option(s): C

80. Six Sigma strategy as a quality goal sets tolerance levels for errors to

- (A) 3.4 times per million observations
- (B) 5 times per million observations
- (C) 5.4 times per million observations
- (D) 6.4 times per million observations

Correct Option(s): A

81. DMAIC is _____

- (A) develop, multiply, analyze, improve, check
- (B) define, multiply, analyze, improve, control
- (C) define, measure, analyze, improve, control
- (D) define, manufacture, analyze, improve, control

Correct Option(s): C

82. In a six sigma improvement project the least experienced individuals are:

- (A) Green Belt
- (B) Black belts
- (C) Red Belts
- (D) Master Black Belts

Correct Option(s): A

83. Fishbone diagram is an example of

- (A) relevant costing diagram
- (B) cause and effect diagram
- (C) control chart
- (D) None of the given options

Correct Option(s): B

84.

Which of the following is **NOT** among the 7QC tools for investigating the presence of quality problems and their causes

- (A) Decision tree
- (B) Histogram
- (C) Cause-and-effect diagram
- (D) Pareto diagram

Correct Option(s): A

85. The quality chart for attribute include

- (A) c-chart
- (B) p-chart
- (C) both c-chart and p-chart
- (D) mean and range chart

Correct Option(s): C

86. The quality diagram used to identify 80 percent of the causes of the problem is

- (A) Flow diagram
- (B) Scatter diagram
- (C) Control Chart
- (D) Pareto diagram

Correct Option(s): D

87. RPN in quality management denotes _____

- (A) Risk priority number
- (B) Return priority number
- (C) Risk preference number
- (D) Return preference number

Correct Option(s): A

88. In FMEA, if for a particular failure mode, the severity rating is 9, occurrence rating is 8, and detectability rating is 5, then RPN score is:

- (A) 300
- (B) 360
- (C) 380
- (D) 720

Correct Option(s): B

89. Lean production essentially means the elimination of

- (A) Labour
- (B) Time
- (C) Waste
- (D) Problems

Correct Option(s): C

90. Times between two successive arrivals is called as

- (A) Interarrival time
- (B) Arrival time

- (C) Maximum Service time
- (D) Average Service time

Correct Option(s): A

91. The number of arrivals in a hospital emergency follows a Poisson distribution with mean $\lambda = 6/\text{hour}$. What is the mean inter-arrival time (in minutes)?

- (A) 10
- (B) 12
- (C) 15
- (D) 20

Correct Option(s): A

92. Customers enter a waiting line on a first-come, first-served basis. The arrival rate follows a Poisson distribution, while service times follow an exponential distribution. If the average arrival rate is four per hour and service rate is five per hour, what is the system utilization (Rho)?

- (A) .8 or 80 %
- (B) .6 or 60 %
- (C) .5 or 50 %
- (D) .4 or 40 %

Correct Option(s): A

93. An operations manager should try to achieve in a queuing system

- (A) that minimizes the waiting costs
- (B) that minimizes the capacity costs
- (C) that minimizes the sum of waiting costs and capacity costs
- (D) None of the given options

Correct Option(s): C

94. The average number of patients in the system is

- (A) the average number in queue
- (B) the average number in queue plus the average number being served
- (C) Both the given options
- (D) None of the given options

Correct Option(s): B

95. Patients arrive at a hospital Outpatient Pharmacy at a rate of 15 per hour. The inter-arrival time is

- (A) 4 min
- (B) 5 min
- (C) 6 min
- (D) 10 min

Correct Option(s): A

96. A pharmacist is serving the patients at a rate of 30 per hour. The average service time is

- (A) 1 min
- (B) 2 min
- (C) 3 min
- (D) 4 min

Correct Option(s): B

97. In multiple server system (with s servers), the server utilization can be determined using the formula:

- (A) λ / μ
- (B) $2\lambda / \mu$
- (C) $\lambda / s \mu$
- (D) $\lambda * \mu$

Correct Option(s): C

98. In a queuing system, which of the following is usually the most difficult cost to determine?

- (A) service cost
- (B) facility cost
- (C) waiting cost
- (D) None of the given options

Correct Option(s): C

99. One physician on duty full time works in a hospital emergency room. Previous experience has shown that emergency patients arrive according to a Poisson distribution with an average rate of four per hour. The physician can provide emergency treatment for approximately six patients per hour. The system utilization is

- (A) 0.5
- (B) 0.66
- (C) 0.8
- (D) 0.9

Correct Option(s): B

100.

In a single server queuing model, people call a suburban hospital's health hotline at the rate of eighteen per hour and it takes an average of three minutes per call to answer their query. What is the probability that the server is idle?

- (A) 0.9
- (B) 0.8
- (C) 0.2
- (D) 0.1

Correct Option(s): D

