DU MPhil Phd in Operational Research

Topic:- DU_J19_MPHIL_OR

1) If the number of arrivals during a given time period is independent of the number of arrivals that have already occurred prior to the beginning of time interval, then the new arrivals follow _____ distribution. [Question ID = 12796]

1. Exponential [Option ID = 21183]
2. Normal [Option ID = 21184]
3. Poisson [Option ID = 21182]
4. Erlang [Option ID = 21181]

Correct Answer :-

- Erlang [Option ID = 21181]

2) Which is the odd one out? Modern qualitative research can generally involve a detailed study of

[Question ID = 12812]

1. text [Option ID = 21246]
2. media content [Option ID = 21247]
3. conversational exchanges between people and interviews [Option ID = 21248]
4. psychological characteristics of interesting individuals [Option ID = 21245]

Correct Answer :-

- psychological characteristics of interesting individuals [Option ID = 21245]

3) There is a congestion of the platform of a railway station. The trains arrive at the rate of 30 trains per day. The waiting time for any train to clean is exponentially distributed with an average of 36 minutes. The mean queue size is [Question ID = 12798]

1. 3 trains [Option ID = 21189]
2. 4 trains [Option ID = 21192]
3. 2 trains [Option ID = 21190]
4. 1 train [Option ID = 21191]

Correct Answer :-

- 3 trains [Option ID = 21189]

4) A certain type of commodity costs Rs.1 per unit, and inventory carrying charges are 20% of average inventory cost. Annual demand is 8,000 units, and the order cost is Rs.12.50 per order. What is the inventory carrying cost? [Question ID = 12793]

1. Rs. 99 [Option ID = 21172]
2. Rs. 105 [Option ID = 21170]
3. Rs. 100 [Option ID = 21169]
4. Rs. 101 [Option ID = 21171]

Correct Answer :-

- Rs. 100 [Option ID = 21169]

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5) Basic components of a research report in correct order are [Question ID = 12816]

1. abstract, methodology, results [Option ID = 21261]
2. abstract, introduction, results, discussions [Option ID = 21262]
3. abstract, introduction, methodology, discussions, results, references [Option ID = 21264]
4. abstract, introduction, methodology, results, discussions, references [Option ID = 21263]

Correct Answer :-

- abstract, methodology, results [Option ID = 21261]

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6) If $P(A) = 0.8$, $P(B) = 0.3$ and $P(A/B) = 0.6$, then $P(A \text{ and } B)$ is

[Question ID = 12808]

1. 0.03 [Option ID = 21231]
2. 0.24 [Option ID = 21230]
3. 0.18 [Option ID = 21229]
4. 0.3 [Option ID = 21232]

Correct Answer :-

- 0.18 [Option ID = 21229]

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7) The study in which the investigators attempt to trace an effect is known as [Question ID = 12820]

1. survey research [Option ID = 21277]
2. none of these [Option ID = 21280]
3. historical research [Option ID = 21278]
4. 'Ex-post facto' research [Option ID = 21279]

Correct Answer :-

- survey research [Option ID = 21277]

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8) If a statistics professor tells his class: "All those who got 100 marks in the statistics test got 20 marks in the mathematics test, and all those who got 100 marks in the mathematics test got 20 marks in the statistics test", then he means that the correlation between the statistics test and the mathematics test is [Question ID = 12811]

1. zero [Option ID = 21243]
2. negative [Option ID = 21241]
3. positive [Option ID = 21242]
4. difficult to tell [Option ID = 21244]

Correct Answer :-

- negative [Option ID = 21241]

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9) If a study is 'reliable', this means that [Question ID = 12810]

1. the measures devised for concepts are stable on different occasions [Option ID = 21238]
2. the methods are stated clearly enough for the research to be replicated [Option ID = 21240]
3. it was conducted by a reputable researcher who can be trusted [Option ID = 21237]
4. the findings can be generalized to other social settings [Option ID = 21239]

Correct Answer :-

- it was conducted by a reputable researcher who can be trusted [Option ID = 21237]

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10) Sarah Brown works for a manufacturer that makes parts for marine engines. The parts are made in batches, and every time a new batch is started it costs Rs. 1,640 for disruption and lost production and Rs. 280 in wages for the fitters. One item has an annual demand of 1,250 units with a selling price of Rs. 300, 60 per cent of which is direct material and production costs. If the company looks for a return of 20 per cent a year on capital, what is the optimal batch size for the item?

[Question ID = 12794]

1. 280 units (about) [Option ID = 21174]
2. 410 units (about) [Option ID = 21176]
3. 365 units (about) [Option ID = 21173]
4. 310 units (about) [Option ID = 21175]

Correct Answer :-

- 365 units (about) [Option ID = 21173]

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11) In a simple queuing model, the waiting time in the system is given by [Question ID = 12797]

1. $1/(\mu - \lambda)$ [Option ID = 21186]
2. $(L_q - \lambda) + 1/\mu$ [Option ID = 21185]
3. $W_q + \mu$ [Option ID = 21188]
4. $\mu/(\mu - \lambda)$ [Option ID = 21187]

Correct Answer :-

- $(L_q - \lambda) + 1/\mu$ [Option ID = 21185]

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12) Cronbach's alpha reliability is _____. [Question ID = 12828]

1. the correlation of half of the items with the total participants [Option ID = 21311]
2. the correlation of each item with the sum of the items [Option ID = 21310]
3. an average of all possible split-half reliabilities [Option ID = 21309]
4. none of these [Option ID = 21312]

Correct Answer :-

- an average of all possible split-half reliabilities [Option ID = 21309]

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13) From a pack of 52 cards, two cards are drawn at random. The probability that one is an ace and the other is a king is [Question ID = 12806]

1. 1/169 [Option ID = 21222]
2. 16/169 [Option ID = 21223]
3. 2/13 [Option ID = 21221]
4. 8/663 [Option ID = 21224]

Correct Answer :-

- 2/13 [Option ID = 21221]

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14) What sort of variable is dress size? [Question ID = 12818]

1. Ordinal [Option ID = 21269]

2. Nominal [Option ID = 21270]
3. Ratio [Option ID = 21271]
4. Dependent [Option ID = 21272]

Correct Answer :-

- Ordinal [Option ID = 21269]

15) When a research problem is related to heterogeneous population, the most suitable sampling method is [Question ID = 12823]

1. stratified sampling [Option ID = 21291]
2. cluster sampling [Option ID = 21290]
3. convenient sampling [Option ID = 21292]
4. lottery method [Option ID = 21289]

Correct Answer :-

- lottery method [Option ID = 21289]

16) In degenerate solution of a transportation problem that has m-rows and n-columns, the number of allocated cells can be_____.

[Question ID = 12781]

1. equal to m+n-1 [Option ID = 21121]
2. may or may not equal to m+n-1 [Option ID = 21122]
3. less than m+n-1 [Option ID = 21123]
4. both may or may not equal to m+n-1 and less than m+n-1 [Option ID = 21124]

Correct Answer :-

- equal to m+n-1 [Option ID = 21121]

17) Independent variables that are not related to the purpose of the research, but may affect the dependent variable are termed as_____.

[Question ID = 12813]

1. discrete variables [Option ID = 21250]
2. continuous variables [Option ID = 21251]
3. none of these [Option ID = 21252]
4. extraneous variables [Option ID = 21249]

Correct Answer :-

- extraneous variables [Option ID = 21249]

18) In the definition of linear programming problem, if m stands for number of constraints and n for number of variables, then which of the following relations hold?

[Question ID = 12779]

1. $m = n$ [Option ID = 21113]
2. $m \leq n$ [Option ID = 21114]
3. $m \geq n$ [Option ID = 21115]
4. none of these [Option ID = 21116]

Correct Answer :-

- $m = n$ [Option ID = 21113]

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19) The difference between the mean of a researcher's sample and the mean of the population of the sample is known as the [Question ID = 12827]

1. sampling error [Option ID = 21308]
2. confidence interval [Option ID = 21306]
3. standard deviation [Option ID = 21307]
4. significance level [Option ID = 21305]

Correct Answer :-

- significance level [Option ID = 21305]

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20) The linear programming problem min z = $-2x_1+10x_2$ s.t. $x_1-x_2\geq0$, $-x_1+5x_2\geq5$, $x_1\geq0$, $x_2\geq0$ has

[Question ID = 12785]

1. an alternate optimal solution [Option ID = 21137]
2. an unbounded solution [Option ID = 21139]
3. none of these [Option ID = 21140]
4. a unique optimal solution [Option ID = 21138]

Correct Answer :-

- an alternate optimal solution [Option ID = 21137]

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21) A statistical measure based upon the entire population is called parameter while measure based upon a sample is known as [Question ID = 12819]

1. inference [Option ID = 21273]
2. none of these [Option ID = 21276]
3. sample parameter [Option ID = 21275]
4. statistics [Option ID = 21274]

Correct Answer :-

- inference [Option ID = 21273]

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22) A system with m equality constraints can be reduced to an equivalent system that has [Question ID = 12789]

1. both $m+1$ inequality constraints and $2m$ inequality constraints [Option ID = 21156]
2. $2m$ inequality constraints [Option ID = 21155]
3. $m-1$ inequality constraints [Option ID = 21154]
4. $m+1$ inequality constraints [Option ID = 21153]

Correct Answer :-

- $m+1$ inequality constraints [Option ID = 21153]

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23) A linear programming problem in standard form has m constraints and n variables. Then number of adjacent vertices corresponding to any vertex in its feasible region are

[Question ID = 12786]

1. $\leq n - m$ [Option ID = 21142]

2. $n!/m!(n-m)!$ [Option ID = 21143]
3. $n-m$ [Option ID = 21141]
4. none of these [Option ID = 21144]

Correct Answer :-

- $n-m$ [Option ID = 21141]

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24) Consider the following scenerio: the inter-arrival time is exponentially distributed with a mean of 10 minutes and the service time is also exponentially distributed with a mean of 8 minutes. Then the mean wait in the system and mean number in the system, respectively, are

[Question ID = 12799]

1. none of these [Option ID = 21196]
2. 35 minutes, 3 [Option ID = 21194]
3. 30 minutes, 6 [Option ID = 21195]
4. 40 minutes, 4 [Option ID = 21193]

Correct Answer :-

- 40 minutes, 4 [Option ID = 21193]

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25) Consider the linear programming problem min $z = C^Tx$ subject to $Ax \le b, x \ge 0, b \ge 0$. If the cost vector C is replaced by aC, $a > 0$ then

[Question ID = 12788]

1. the optimal solution of the original problem remains optimal [Option ID = 21149]
2. the optimal solution of the original problem will no more be optimal [Option ID = 21150]
3. none of these [Option ID = 21152]
4. there will be no change in the optimal objective value [Option ID = 21151]

Correct Answer :-

- the optimal solution of the original problem remains optimal [Option ID = 21149]

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26) The research that aims at immediate application is called [Question ID = 12826]

1. empirical research [Option ID = 21303]
2. longitudinal research [Option ID = 21302]
3. fundamental research [Option ID = 21304]
4. action research [Option ID = 21301]

Correct Answer :-

- action research [Option ID = 21301]

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27) Let primal be a minimization type linear programming problem and let a feasible solution which is not optimal of primal causes objective function value to 25. Then which of the following can be the value of dual objective function [Question ID = 12783]

1. cannot be determined [Option ID = 21132]
2. 24.5 [Option ID = 21130]
3. 25 [Option ID = 21129]
4. 26 [Option ID = 21131]

Correct Answer :-

- 25 [Option ID = 21129]

28) A commonly used estimate for inventory carrying costs is _____. [Question ID = 12791]

1. 20% [Option ID = 21164]
2. 25% [Option ID = 21162]
3. 10% [Option ID = 21163]
4. 35% [Option ID = 21161]

Correct Answer :-

- 35% [Option ID = 21161]

29) Variables that reside outside the system in which the problem resides, for example, demand in an inventory control model are called [Question ID = 12814]

1. none of these [Option ID = 21256]
2. continuous variables [Option ID = 21255]
3. endogeneous variables [Option ID = 21253]
4. exogeneous variables [Option ID = 21254]

Correct Answer :-

- endogeneous variables [Option ID = 21253]

30) The mode of geometric distribution $\left(\frac{1}{2}\right)^X, X = 1,2,\ldots$ is

[Question ID = 12804]

1. does not exist [Option ID = 21216]
2. 0 [Option ID = 21214]
3. 1/2 [Option ID = 21215]
4. 1 [Option ID = 21213]

Correct Answer :-

- 1 [Option ID = 21213]

31) The relation $r = \sqrt{b_{YX}b_{XY}}$ is known as

[Question ID = 12809]

1. none of these [Option ID = 21236]
2. fundamental property of regression coefficient [Option ID = 21234]
3. mean property of regression coefficient [Option ID = 21233]
4. signature property of regression coefficient [Option ID = 21235]

Correct Answer :-

- mean property of regression coefficient [Option ID = 21233]

32) For the nonlinear programming problem $\min f(x) = 2x_1^2 + x_2^2 + 3x_3^2 + 10x_1 + 8x_2 + 6x_3 - 100$ $s.t.$ $x_1 + x_2 + x_3 = 20, x_1, x_2, x_3 \geq 0$, the stationary point resulting from the Lagrange multiplier method is

[Question ID = 12787]

1. $(x_1 = 2, \ x_2 = 11, x_3 = 3)$ [Option ID = 21148]

2. $(x_1 = 5, \ x_2 = 11, x_3 = 4)$ [Option ID = 21145]

3. $(x_1 = 2, \ x_2 = 1, x_3 = 4)$ [Option ID = 21146]

4. $(x_1 = 5, \ x_2 = 10, x_3 = 4)$ [Option ID = 21147]

Correct Answer :-

• $(x_1 = 5, \ x_2 = 11, x_3 = 4)$ [Option ID = 21145]

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33) For primal linear programming problem max z = $5x_1+2x_2$ s.t. $x_1+x_2\leq3$, $2x_1+3x_2\geq5$, $x_1\geq0$, $x_2\geq0$, which of the following primal-dual solutions (y_1, y_2 are dual variables) is optimal

[Question ID = 12784]

1. $x_1 = 2$, $x_2 = 5$, $y_1 = 1$, $y_2 = 5$ [Option ID = 21136]
2. $x_1 = 3$, $x_2 = 1$, $y_1 = 4$, $y_2 = 1$ [Option ID = 21133]
3. $x_1 = 3$, $x_2 = 0$, $y_1 = 5$, $y_2 = 0$ [Option ID = 21135]
4. $x_1 = 4$, $x_2 = 1$, $y_1 = 1$, $y_2 = 0$ [Option ID = 21134]

Correct Answer :-

• $x_1 = 3$, $x_2 = 1$, $y_1 = 4$, $y_2 = 1$ [Option ID = 21133]

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34) Response rate refers to _____.

[Question ID = 12822]

1. the proportion of the people who take part in a study [Option ID = 21285]
2. how variable participants' responses are [Option ID = 21286]
3. how big a population is [Option ID = 21287]
4. how confident you want to be about your results [Option ID = 21288]

Correct Answer :-

• the proportion of the people who take part in a study [Option ID = 21285]

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35) What is the name for a variable which is measured using two different values?

[Question ID = 12807]

1. Binary [Option ID = 21226]
2. Binomial [Option ID = 21225]

3. all of these [Option ID = 21228]
4. Dichotomous [Option ID = 21227]

Correct Answer :-

- Binomial [Option ID = 21225]

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36) Which of the following are synonyms? [Question ID = 12782]

1. none of these [Option ID = 21128]
2. Hungarian method and reduced matrix method [Option ID = 21125]
3. Hungarian method and northwest corner rule [Option ID = 21127]
4. Stepping-stone method and reduced matrix method [Option ID = 21126]

Correct Answer :-

- Hungarian method and reduced matrix method [Option ID = 21125]

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37) Which of the following approach relies on direct observation and experimentation in the acquisition of new knowledge? [Question ID = 12824]

1. Empirical [Option ID = 21294]
2. none of these [Option ID = 21296]
3. Science [Option ID = 21293]
4. Operational [Option ID = 21295]

Correct Answer :-

- Science [Option ID = 21293]

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38) Which of the following are the most similar? [Question ID = 12825]

1. Ordinal, interval and ratio data [Option ID = 21299]
2. Nominal and ratio data [Option ID = 21300]
3. Nominal, ordinal and ratio data [Option ID = 21298]
4. Nominal, ratio, and interval data [Option ID = 21297]

Correct Answer :-

- Nominal, ratio, and interval data [Option ID = 21297]

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39) Which of the following is not a citation style? [Question ID = 12815]

1. Greenburg Citation Style [Option ID = 21260]
2. MLA Citation Style [Option ID = 21258]
3. Chicago Citation Style [Option ID = 21259]
4. APA Citation Style [Option ID = 21257]

Correct Answer :-

- APA Citation Style [Option ID = 21257]

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40) Which of the following is not considered a reliability design method? [Question ID = 12801]

1. Accessibility [Option ID = 21201]
2. Choice of Technology [Option ID = 21204]
3. Parts selection [Option ID = 21202]

4. Use of redundancy [Option ID = 21203]

Correct Answer :-

- Accessibility [Option ID = 21201]

41) Which of the following analysis neither considers cost nor value? [Question ID = 12792]

1. ABC   [Option ID = 21165]
2. XYZ [Option ID = 21166]
3. HML [Option ID = 21167]
4. VED [Option ID = 21168]

Correct Answer :-

- ABC   [Option ID = 21165]

42) Which one is called non-probability sampling? [Question ID = 12817]

1. Systematic sampling [Option ID = 21267]
2. Stratified random sampling [Option ID = 21268]
3. Cluster sampling [Option ID = 21266]
4. Quota sampling [Option ID = 21265]

Correct Answer :-

- Quota sampling [Option ID = 21265]

43) Which one of the following is the most comprehensive source of population data? [Question ID = 12821]

1. Census [Option ID = 21281]
2. National Sample Surveys [Option ID = 21282]
3. National Family Health Surveys [Option ID = 21284]
4. Demographic Health Surveys [Option ID = 21283]

Correct Answer :-

- Census [Option ID = 21281]

44) Let the optimal solution of the primal problem be degenerate. Then the dual problem has

[Question ID = 12780]

1. alternative optimal solution [Option ID = 21118]
2. unbounded solution [Option ID = 21119]
3. a unique optimal solution [Option ID = 21117]
4. no feasible solution [Option ID = 21120]

Correct Answer :-

- a unique optimal solution [Option ID = 21117]

45) The direct inventories does not include [Question ID = 12795]

1. Raw material inventories [Option ID = 21177]
2. Lot size inventory [Option ID = 21180]

3. Finished goods inventories [Option ID = 21178]
4. Spare parts inventories [Option ID = 21179]

Correct Answer :-

- Raw material inventories [Option ID = 21177]

46) Which method is used to predict new device reliability during its early design stage? [Question ID = 12800]

1. Accelerated testing method [Option ID = 21200]
2. Burn-in method [Option ID = 21197]
3. Part stress analysis method [Option ID = 21198]
4. Parts count method [Option ID = 21199]

Correct Answer :-

- Burn-in method [Option ID = 21197]

47) A system consists of four components. If more than two of the components fail, the system fails. If the components have an exponential time-to-fail distribution with a failure rate of 0.000388, the system mean time-to-fail is

[Question ID = 12803]

1. 2678 [Option ID = 21211]
2. 2700 [Option ID = 21210]
3. 2792 [Option ID = 21209]
4. 2500 [Option ID = 21212]

Correct Answer :-

- 2792 [Option ID = 21209]

48) If for a distribution the coefficient of Kurtosis is less than zero, then the frequency curve is [Question ID = 12805]

1. leptokurtic [Option ID = 21217]
2. mesokurtic [Option ID = 21219]
3. any of these [Option ID = 21220]
4. platykurtic [Option ID = 21218]

Correct Answer :-

- leptokurtic [Option ID = 21217]

49) The system $Ax = b$, $x \geq 0$ has no solution if and only if the system $A^Ty \leq 0$, $b^Ty > 0$ has a solution is referred to as

[Question ID = 12790]

1. Charne's lemma [Option ID = 21160]
2. Farka's lemma [Option ID = 21157]
3. Dantzig's lemma [Option ID = 21159]
4. Abel's lemma [Option ID = 21158]

Correct Answer :-

- Farka's lemma [Option ID = 21157]

50) The individual part failure rate given a base failure rate of 0.0333 failure/hour, a quality factor of 0.98 and an environment stress factor of 0.92 is

[Question ID = 12802]

1. 0.30 failure/hour [Option ID = 21205]
2. 0.03 failure/hour [Option ID = 21207]
3. 0.13 failure/hour [Option ID = 21206]
4. 0.23 failure/hour [Option ID = 21208]

Correct Answer :-

- 0.30 failure/hour [Option ID = 21205]