Topic:- NEW_DU_J18_MSC_OR

1) In queuing theory, the calling population is another name for [Question ID = 6821]

1. the service rate [Option ID = 27277]
2. the market researchers [Option ID = 27276]
3. the queue size [Option ID = 27275]
4. the input source [Option ID = 27278]

Correct Answer :-

- the input source [Option ID = 27278]

2) The improvement in the objective function value with respect to per unit change in a right-hand side is called [Question ID = 6815]

1. slack value [Option ID = 27254]
2. shadow price [Option ID = 27252]
3. sensitivity value [Option ID = 27251]
4. constraint coefficient [Option ID = 27253]

Correct Answer :-

- shadow price [Option ID = 27252]

3) Which of the following statement is not true?

[Question ID = 6788]

1. the set of rational numbers is not a neighborhood of any of its points [Option ID = 27144]
2. the closed interval [a,b] is a neighborhood of each of its points [Option ID = 27145]
3. the nonempty finite set is not a neighborhood of any point [Option ID = 27146]
4. the open interval (a,b) is a neighborhood of each of its points [Option ID = 27143]

Correct Answer :-

- the closed interval [a,b] is a neighborhood of each of its points [Option ID = 27145]

4) Which of the following characteristics apply to a queuing system?

[Question ID = 6819]

1. A) customer population [Option ID = 27267]
2. B) arrival process [Option ID = 27268]
3. C) both (A) & (B) [Option ID = 27269]
4. D) none of these [Option ID = 27270]

Correct Answer :-

- C) both (A) & (B) [Option ID = 27269]

5) While solving a linear programming problem, the infeasibility may be removed by [Question ID = 6825]

1. removing a constraint [Option ID = 27293]
2. removing a variable [Option ID = 27294]
3. adding another constraint [Option ID = 27291]
4. adding another variable [Option ID = 27292]

Correct Answer :-

- removing a constraint [Option ID = 27293]

6) Read the given information carefully and answer the questions based on it:
In a family, there are six members, A, B, C, D, E and F. A and B are married couple, A being the male member. D is the only son of C, who is the brother of A. E is the sister of D. B is the daughter-in-law of F, whose husband has died.
How is F related to A? [Question ID = 6772]

1. mother-in-law [Option ID = 27082]

2. sister-in-law [Option ID = 27080]
3. sister [Option ID = 27081]
4. mother [Option ID = 27079]

Correct Answer :-

- mother [Option ID = 27079]

---

7) Read the given information carefully and answer the questions based on it:

In a family, there are six members, A, B, C, D, E and F. A and B are married couple, A being the male member. D is the only son of C, who is the brother of A. E is the sister of D. B is the daughter-in-law of F, whose husband has died.

How is E related to C? [Question ID = 6773]

1. none of these [Option ID = 27086]
2. sister [Option ID = 27083]
3. cousin [Option ID = 27085]
4. daughter [Option ID = 27084]

Correct Answer :-

- daughter [Option ID = 27084]

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8) Unboundedness is usually a sign that the linear programming problem [Question ID = 6813]

1. has been formulated improperly [Option ID = 27245]
2. contains too many redundant constraints [Option ID = 27244]
3. has finite multiple solutions [Option ID = 27243]
4. is degenerate [Option ID = 27246]

Correct Answer :-

- has been formulated improperly [Option ID = 27245]

---

9) A series of letters and numbers is given, the terms of which follow certain definite pattern in groups. However, some terms in the series are missing, which are given in the correct order as one of the alternatives. Choose the correct alternative.

F _ U 6 _ 9 I _ T 7 _ 20 _ 4 D 23 [Question ID = 6769]

1. 21, R, 18, G, W [Option ID = 27070]
2. 11, G, 16, K, U [Option ID = 27067]
3. 17, J, 19, R, S [Option ID = 27069]
4. 13, H, 15, L, M [Option ID = 27068]

Correct Answer :-

- 21, R, 18, G, W [Option ID = 27070]

---

10) A series of letters and numbers is given, the terms of which follow certain definite pattern in groups. However, some terms in the series are missing, which are given in the correct order as one of the alternatives. Choose the correct alternative.

2 3 B _ 6 _ F G _ 5 D _ 8 _ H I [Question ID = 6768]

1. C, 7, 4, E, 9 [Option ID = 27063]
2. W, 8, 7, I, 6 [Option ID = 27066]
3. D, 8, 6, C, 7 [Option ID = 27064]
4. E, 8, 7, D, 9 [Option ID = 27065]

Correct Answer :-

- C, 7, 4, E, 9 [Option ID = 27063]

---

11) Concerning the EOQ model, if the ordering costs increase by 10% and the product value increases by 10%, then the EOQ will [Question ID = 6834]

1. stay unchanged [Option ID = 27329]
2. it depends on the particular product [Option ID = 27330]
3. decrease [Option ID = 27328]
4. increase [Option ID = 27327]

Correct Answer :-

- stay unchanged [Option ID = 27329]

---

12) When redundancy is provided in the system, the system reliability

[Question ID = 6830]

1. none of these [Option ID = 27314]

2. increases [Option ID = 27311]
3. decreases [Option ID = 27312]
4. does not change [Option ID = 27313]

Correct Answer :-

- increases [Option ID = 27311]

---

13) In a moderately skewed distribution, mean is equal to [Question ID = 6806]

1. (3median - mode) / 2 [Option ID = 27215]
2. 3median – mode [Option ID = 27218]
3. 3median – 2mean [Option ID = 27217]
4. (2mean + mode) / 3 [Option ID = 27216]

Correct Answer :-

- (3median - mode) / 2 [Option ID = 27215]

---

14) What are the two attributes of costs in queuing analysis? [Question ID = 6820]

1. equipment breakdowns and departures [Option ID = 27274]
2. waiting customers and service offered [Option ID = 27273]
3. arrivals and idleness [Option ID = 27272]
4. arrivals and departures [Option ID = 27271]

Correct Answer :-

- waiting customers and service offered [Option ID = 27273]

**15) From the alternatives given, choose the most appropriate one which best expresses the meaning of the given word.
FANCIFUL [Question ID = 6758]**

1. imaginative [Option ID = 27025]
2. decorative [Option ID = 27023]
3. extensive [Option ID = 27024]
4. elaborate [Option ID = 27026]

Correct Answer :-

- imaginative [Option ID = 27025]

**16) From the alternatives given, choose the most appropriate one which best expresses the meaning of the given word.
SHREWD [Question ID = 6759]**

1. smart [Option ID = 27029]
2. cunning [Option ID = 27028]
3. intelligent [Option ID = 27030]
4. clever [Option ID = 27027]

Correct Answer :-

- cunning [Option ID = 27028]

---

17) The antonym of the word AMBIGUITY is [Question ID = 6760]

1. Maturate [Option ID = 27033]
2. Contamination [Option ID = 27031]
3. Transparency [Option ID = 27034]
4. Fester [Option ID = 27032]

Correct Answer :-

- Transparency [Option ID = 27034]

---

18) The antonym of the word GRUESOME is [Question ID = 6761]

1. Dark [Option ID = 27035]
2. Ghastly [Option ID = 27036]
3. Beautiful [Option ID = 27038]
4. Rude [Option ID = 27037]

Correct Answer :-

- Beautiful [Option ID = 27038]

19) Fill in the blanks in the following sentences by selecting the most appropriate alternative from the choices given under each sentence.

There are views _____ on the issue of giving bonus to the employees. [Question ID = 6754]

1. modest [Option ID = 27009]
2. independent [Option ID = 27007]
3. divergent [Option ID = 27008]
4. valuable [Option ID = 27010]

Correct Answer :-

- divergent [Option ID = 27008]

20) Fill in the blanks in the following sentences by selecting the most appropriate alternative from the choices given under each sentence.

Even though Hema is usually calm, she appeared _____ and was walking up and down. [Question ID = 6755]

1. disagreed [Option ID = 27013]
2. discontented [Option ID = 27012]
3. disconcerted [Option ID = 27014]
4. displeased [Option ID = 27011]

Correct Answer :-

- disconcerted [Option ID = 27014]

21) The primary motivation for using boolean algebra to simplify logic expressions is [Question ID = 6841]

1. to make it easier to understand the overall function of the circuit [Option ID = 27355]
2. all of these [Option ID = 27358]
3. to reduce the number of gates [Option ID = 27356]
4. to reduce the number of inputs required [Option ID = 27357]

Correct Answer :-

- all of these [Option ID = 27358]

22) Economic order quantity is the order quantity that _____ over planning horizon.

[Question ID = 6817]

1. the required safety stock [Option ID = 27262]
2. minimizes total carrying costs [Option ID = 27260]
3. minimizes total inventory costs [Option ID = 27261]
4. minimizes total ordering costs [Option ID = 27259]

Correct Answer :-

- minimizes total inventory costs [Option ID = 27261]

23) The process of adding a new record to an existing file is called [Question ID = 6845]

1. appending [Option ID = 27374]
2. editing [Option ID = 27373]
3. amending [Option ID = 27371]
4. updating [Option ID = 27372]

Correct Answer :-

- appending [Option ID = 27374]

24) The probability that a house in an urban area will be burglarized is 5%. If 20 houses are randomly selected, what is the mean of the number of houses burglarized? [Question ID = 6804]

1. 0.5 [Option ID = 27209]
2. 1 [Option ID = 27210]
3. 10 [Option ID = 27208]
4. 1.5 [Option ID = 27207]

Correct Answer :-

- 1 [Option ID = 27210]

25) The protocol that provides e-mail facility among different hosts is [Question ID = 6844]

1. FTP [Option ID = 27367]

2. SNMP [Option ID = 27370]
3. SMTP [Option ID = 27368]
4. TELNET [Option ID = 27369]

Correct Answer :-

- SMTP [Option ID = 27368]

---

26) Johnson left for his office in his car. He drove 15 km towards north and then 10 km towards west. He then turned to the south and covered 5 km. Further, he turned to the east and moved 8 km. Finally, he turned right and drove 10 km. How far and in which direction is he from his starting point? [Question ID = 6763]

1. 5 km east [Option ID = 27044]
2. 6 km south [Option ID = 27046]
3. 2 km west [Option ID = 27043]
4. 3 km north [Option ID = 27045]

Correct Answer :-

- 2 km west [Option ID = 27043]

---

27) The new system of constraints after adding artificial variables is equivalent to the old system of constraints only if the artificial variables are valued at _____. [Question ID = 6832]

1. zero [Option ID = 27322]
2. two [Option ID = 27321]
3. one [Option ID = 27319]
4. three [Option ID = 27320]

Correct Answer :-

- zero [Option ID = 27322]

---

28) The two basic types of record access method are [Question ID = 6846]

1. on-line and real time [Option ID = 27378]
2. direct and immediate [Option ID = 27377]
3. sequential and indexed [Option ID = 27376]
4. sequential and ordered [Option ID = 27375]

Correct Answer :-

- sequential and indexed [Option ID = 27376]

---

29) If annual demand is 9,000 units, ordering cost is Rs. 50 per order, holding cost is Rs. 10 per unit per year, then the optimal order quantity Q* is

[Question ID = 6818]

1. 300 units [Option ID = 27264]
2. 250 units [Option ID = 27263]
3. 400 units [Option ID = 27265]
4. 380 units [Option ID = 27266]

Correct Answer :-

- 300 units [Option ID = 27264]

---

30) The dependent variable is also called [Question ID = 6799]

1. continuous variable [Option ID = 27189]
2. regression [Option ID = 27187]
3. regressor [Option ID = 27190]
4. regressand [Option ID = 27188]

Correct Answer :-

- regressand [Option ID = 27188]

---

31) Regression modeling is a statistical framework for developing a mathematical equation that describes how [Question ID = 6797]

1. several explanatory and several response variables are related [Option ID = 27180]
2. one response and one or more explanatory variables are related [Option ID = 27181]
3. one explanatory and one or more response variables are related [Option ID = 27179]
4. all of these [Option ID = 27182]

32) An incomplete sentence is followed by fillers. Pick up the best option to complete the sentence. Anything in this shop can be bought, _____ [Question ID = 6757]

1. can't we? [Option ID = 27019]
2. can't anything? [Option ID = 27022]
3. can't all? [Option ID = 27021]
4. can't it? [Option ID = 27020]

Correct Answer :-

- can't we? [Option ID = 27019]
- can't it? [Option ID = 27020]

33) An incomplete sentence is followed by fillers. Pick up the best option to complete the sentence. "Where are my spectacles?" _____ [Question ID = 6756]

1. here they are, on your nose! [Option ID = 27016]
2. there are they, on your nose! [Option ID = 27017]
3. there they are, on your nose! [Option ID = 27018]
4. here are they, on your nose! [Option ID = 27015]

Correct Answer :-

- there they are, on your nose! [Option ID = 27018]

34) To test the independence of attributes we use

[Question ID = 6807]

1. binomial distribution [Option ID = 27219]
2. chi-square distribution [Option ID = 27220]
3. F distribution [Option ID = 27222]
4. t distribution [Option ID = 27221]

Correct Answer :-

- chi-square distribution [Option ID = 27220]

35) What aims at optimizing inventory levels? [Question ID = 6816]

1. none of these [Option ID = 27258]
2. inventory capacity [Option ID = 27256]
3. inventory planning [Option ID = 27257]
4. inventory control [Option ID = 27255]

Correct Answer :-

- inventory control [Option ID = 27255]

36) The objective function of a linear programming problem is maximized or minimized at one of the [Question ID = 6831]

1. extreme points [Option ID = 27316]
2. boundary points [Option ID = 27317]
3. non-vertex points [Option ID = 27315]
4. interior points [Option ID = 27318]

Correct Answer :-

- extreme points [Option ID = 27316]

37) Identify the correct sequence of steps to run a program [Question ID = 6838]

1. compile, code, link, load and execute [Option ID = 27346]
2. code, compile, link, load and execute [Option ID = 27345]
3. code, compile, link, execute and load [Option ID = 27344]
4. link, load, code, compile and execute [Option ID = 27343]

Correct Answer :-

- code, compile, link, load and execute [Option ID = 27345]

38)

Identify the pair of words that bear the same relationship to each other as the words of the given pair bear in the question.
Plaintiff : Defendant [Question ID = 6770]

1. injured : accused [Option ID = 27074]
2. attorney : lawyer [Option ID = 27073]
3. judge : jury [Option ID = 27071]
4. court : law [Option ID = 27072]

Correct Answer :-

- injured : accused [Option ID = 27074]

---

39) Identify the pair of words that bear the same relationship to each other as the words of the given pair bear in the question.
Error : Infallible [Question ID = 6771]

1. flaw : impeccable [Option ID = 27076]
2. defect : intolerable [Option ID = 27078]
3. cure : irreversible [Option ID = 27075]
4. emotion : invulnerable [Option ID = 27077]

Correct Answer :-

- flaw : impeccable [Option ID = 27076]

---

40) EPROM contents can be erased by exposing it to [Question ID = 6847]

1. intense heat radiations [Option ID = 27382]
2. infrared rays [Option ID = 27380]
3. burst of microwaves [Option ID = 27381]
4. ultraviolet rays [Option ID = 27379]

Correct Answer :-

- ultraviolet rays [Option ID = 27379]

---

41) The Student t distribution is [Question ID = 6803]

1. the distribution of a random variable with a chi-squared distribution with m degrees of freedom, divided by m [Option ID = 27204]
2. the distribution of the sum of m squared independent standard normal random variables [Option ID = 27203]
3. the distribution of the ratio of a standard normal random variable, divided by the square root of an independently distributed chi-squared random variable with m degrees of freedom divided by m [Option ID = 27206]
4. always well approximated by the standard normal distribution [Option ID = 27205]

Correct Answer :-

- the distribution of the ratio of a standard normal random variable, divided by the square root of an independently distributed chi-squared random variable with m degrees of freedom divided by m [Option ID = 27206]

---

42) In simplex method, we add (if required) _____ in the case of equality type constraint.

[Question ID = 6822]

1. a surplus variable [Option ID = 27280]
2. a slack variable [Option ID = 27279]
3. an artificial variable [Option ID = 27281]
4. none of these [Option ID = 27282]

Correct Answer :-

- an artificial variable [Option ID = 27281]

---

43) In the simplex table, the values in the c_j- z_j row indicate

[Question ID = 6824]

1. the net change in the value of the objective function that will result if one unit of the variable corresponding to the jth column of the constraint matrix is brought into the basis [Option ID = 27289]
2. the values of the decision variables [Option ID = 27290]
3. the value of the objective function [Option ID = 27287]
4. the decrease in value of the objective function that will result if one unit of the variable corresponding to the jth column of the constraint matrix is brought into the basis [Option ID = 27288]

Correct Answer :-

- the net change in the value of the objective function that will result if one unit of the variable corresponding to the jth column of the constraint matrix is brought into the basis [Option ID = 27289]

---

44) A name or number used to identify a storage location is called

[Question ID = 6840]

1. none of these [Option ID = 27354]
2. address [Option ID = 27353]
3. byte [Option ID = 27351]
4. record [Option ID = 27352]

Correct Answer :-

- address [Option ID = 27353]

---

45) Non-overlapping categories or intervals are known as [Question ID = 6796]

1. mutually exclusive and exhaustive [Option ID = 27178]
2. mutually exclusive [Option ID = 27177]
3. inclusive [Option ID = 27175]
4. exhaustive [Option ID = 27176]

Correct Answer :-

- mutually exclusive [Option ID = 27177]

---

46) XYZ Inc. produces two types of paper towels, called regular and super-soaker. Marketing has imposed a constraint that the total monthly production of regular should be no more than twice the monthly production of super-soakers. Letting X_1 be the number of units of regular produced per month and X_2 represent the number of units of super-soaker produced per month, the appropriate constraint is

[Question ID = 53386]

1. $X_1 \leq 2X_2$ [Option ID = 93530]
2. $X_1 \leq 0.5X_2$ [Option ID = 93532]
3. $2X_1 \leq X_2$ [Option ID = 93531]
4. $X_1 - 0.5\,X_2 \geq 0$ [Option ID = 93533]

Correct Answer :-

- $X_1 \leq 2X_2$ [Option ID = 93530]

---

47) Chi-square distribution with regard to symmetry is

[Question ID = 6810]

1. symmetrical [Option ID = 27232]
2. negatively skewed [Option ID = 27231]
3. none of these [Option ID = 27234]
4. positively skewed [Option ID = 27233]

Correct Answer :-

- positively skewed [Option ID = 27233]

---

48) The mean of ten numbers is 58. If one of the numbers is 40, what is mean of other nine? [Question ID = 6795]

1. 18 [Option ID = 27171]
2. 60 [Option ID = 27172]
3. 540 [Option ID = 27174]
4. 162 [Option ID = 27173]

Correct Answer :-

- 60 [Option ID = 27172]

---

49) A fitted least squares regression line

[Question ID = 6798]

1. is evidence for a cause-effect relationship between x and y [Option ID = 27184]
2. can only be computed if a strong linear relationship exists between x and y [Option ID = 27185]
3. may be used to predict a value of y if the corresponding x value is given [Option ID = 27183]
4. none of these [Option ID = 27186]

Correct Answer :-

- may be used to predict a value of y if the corresponding x value is given [Option ID = 27183]

---

50) What will be output of the following program?

```
#include<stdio.h>
int main (){
int a=2,b=7,c=10;
c=a==b;
printf("%d",c);
return 0;
}
```

[Question ID = 6839]

1. 10 [Option ID = 27350]
2. 7 [Option ID = 27349]
3. 2 [Option ID = 27348]
4. 0 [Option ID = 27347]

Correct Answer :-

- 0 [Option ID = 27347]

---

51) The differential equation $2y\,dx - (3y - 2x)dy = 0$ is

[Question ID = 6783]

1. homogeneous and linear, but not exact [Option ID = 27124]
2. exact, homogeneous, and linear [Option ID = 27126]
3. exact and homogeneous, but not linear [Option ID = 27123]
4. exact and linear, but not homogeneous [Option ID = 27125]

Correct Answer :-

- exact, homogeneous, and linear [Option ID = 27126]

---

52) The value of the integral $\int_0^{100\pi} |\sin x|\, dx$ is equal to

[Question ID = 6781]

1. 100n [Option ID = 27118]
2. 100 [Option ID = 27115]
3. 1 [Option ID = 27116]
4. 200 [Option ID = 27117]

Correct Answer :-

- 200 [Option ID = 27117]

---

53)

A statement is given followed by two assumptions numbered I and II. Decide which of the assumption(s) is implicit in the statement.

Statement: You know that your suit is excellent when people ask about your tailor who tailored the suit.

Assumptions: I. People do not ask about your tailor if your suit is not good.

II. The people want to know the criterion of an excellent suit.

[Question ID = 6767]

1. either assumption I or II is implicit [Option ID = 27061]
2. both assumptions are implicit [Option ID = 27062]
3. only assumption I is implicit [Option ID = 27059]
4. only assumption II is implicit [Option ID = 27060]

Correct Answer :-

- only assumption I is implicit [Option ID = 27059]

---

54) The values of A, B, C, and D that make the sum term $\bar{A} + B + \bar{C} + D$ equal to zero are

[Question ID = 6842]

1. A = 0, B = 1, C = 0, D = 0 [Option ID = 27361]
2. A = 1, B = 0, C = 1, D = 1 [Option ID = 27362]
3. A = 1, B = 0, C = 1, D = 0 [Option ID = 27360]
4. A = 1, B = 0, C = 0, D = 0 [Option ID = 27359]

Correct Answer :-

- A = 1, B = 0, C = 1, D = 0 [Option ID = 27360]

---

55) Which of the following sets of vectors in R^3 are linearly independent?

I. $[(1,0,0),(0,1,0),(1,1,0)]$

II. $[(1,0,0),(0,1,0),(0,0,1)]$

III. $[(0,1,0),(1,0,1),(1,1,0)]$

IV. $[(0,0,1),(0,1,0),(0,1,1)]$

[Question ID = 6775]

1. I and IV [Option ID = 27094]
2. I and II [Option ID = 27091]
3. II and III [Option ID = 27092]
4. III and IV [Option ID = 27093]

Correct Answer :-

- II and III [Option ID = 27092]

---

56) Consider the function $f(x) = |x|^3$ where x is real, then the function $f(x)$ at $x = 0$ is

[Question ID = 6780]

1. once differentiable but not twice [Option ID = 27112]
2. twice differentiable but not thrice [Option ID = 27113]
3. continuous but not differentiable [Option ID = 27111]
4. thrice differentiable [Option ID = 27114]

Correct Answer :-

- twice differentiable but not thrice [Option ID = 27113]

57)

Let $f(x, y) = \begin{cases} \frac{x^2 y^2}{x^2 + y^2}, & (x, y) \neq (0, 0) \\ 0, & (x, y) = (0, 0) \end{cases}$, then

1. $f_{xy}(0, 0) = f_{yx}(0, 0) = 0$ [Option ID = 27139]

2. $f_{xy}(0, 0) = f_{yx}(0, 0) = 1$ [Option ID = 27141]

3. $f_{xy}(0, 0) \neq f_{yx}(0, 0)$ [Option ID = 27140]

4. none of these   [Option ID = 27142]

Correct Answer :-

- $f_{xy}(0, 0) = f_{yx}(0, 0) = 0$ [Option ID = 27139]

---

58) The minimum value of $|x^2 - 5x + 21|$ is

[Question ID = 6790]

1. 2 [Option ID = 27154]
2. -5 [Option ID = 27151]
3. 0 [Option ID = 27152]
4. -1 [Option ID = 27153]

Correct Answer :-

---

59) The numbers x and y satisfy the given inequalities: $2x + 3y \leq 23, x + 2 \leq 3y, 3y + 1 \leq 4x$. The largest possible value of x is

[Question ID = 6826]

1. 6 [Option ID = 27295]
2. 7 [Option ID = 27296]
3. 8 [Option ID = 27297]
4. 0.9 [Option ID = 27298]

Correct Answer :-

- 7 [Option ID = 27296]

---

60) If $f(x, y) = x^2 + y^2$ then $|\nabla^2 f|$ is

[Question ID = 6791]

1. 4

   [Option ID = 27155]

2. $4(x + y)^2$

   [Option ID = 27158]

3. 2

   [Option ID = 27156]

4. 0

   [Option ID = 27157]

61) A statement is given followed by two assumptions numbered I and II. Decide which of the assumption(s) is implicit in the statement.

Statement: Provide mid-day meals to the children in primary schools to increase the number of students attending schools.

Assumptions: I. Mid-day meals will attract the children to the schools.

II. Those children who are otherwise deprived good food will attend the schools.
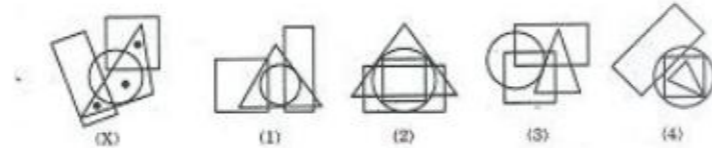
[Question ID = 6766]

1. either assumption I or II is implicit [Option ID = 27057]
2. both assumptions are implicit [Option ID = 27058]
3. only assumption I is implicit [Option ID = 27055]
4. only assumption II is implicit [Option ID = 27056]

62) From amongst the figures marked (1), (2), (3) and (4), select the figure which satisfies the same conditions of placement of the dots as in figure (X).

[Question ID = 6764]

1. 2 [Option ID = 27048]
2. 1 [Option ID = 27047]
3. 3 [Option ID = 27049]
4. 4 [Option ID = 27050]

63) The eigen values of the matrix $\begin{pmatrix} 2 & 1 & 2 \\ 0 & 1 & 3 \\ 0 & 0 & 1 \end{pmatrix}$ are

[Question ID = 6793]

1. 1,2,2 [Option ID = 27164]
2. 2,1,1 [Option ID = 27166]
3. 2,2,3 [Option ID = 27163]
4. 1,1,3 [Option ID = 27165]

64)

If $z = (\cos\theta + i\sin\theta)$ then $z^n - \dfrac{1}{z^n}$ is

[Question ID = 6792]

1. $2\sin n\theta$

   [Option ID = 27161]

2. $2\cos n\theta$

   [Option ID = 27160]

3. $2i\sin n\theta$

   [Option ID = 27159]

4. -1

   [Option ID = 27162]

Correct Answer :-

- $2i\sin n\theta$

  [Option ID = 27159]

---

65) The mean of the log normal distribution $LN\,Y(\mu, \sigma^2)$ is

[Question ID = 6837]

1. $E(Y) = e^{\frac{\mu\sigma^2}{2}}$

   [Option ID = 27341]

2. $E(Y) = e^{\mu + (\frac{\sigma^2}{2})}$

   [Option ID = 27339]

3. $E(Y) = e^{(\sigma - \mu^2)/2}$

   [Option ID = 27342]

4. $E(Y) = e^{(\mu + \sigma^2)/2}$

   [Option ID = 27340]

Correct Answer :-

- $E(Y) = e^{\mu + (\frac{\sigma^2}{2})}$

  [Option ID = 27339]

---

66) Consider the differential equation $y'' + 6y' + 25y = 0$ with initial condition $y(0) = 0$.
Then, the general solution of the initial value problem is

[Question ID = 6784]

1. $Be^{-3x}\sin 4x$ [Option ID = 27128]

2. $e^{-3x}(A\cos 4x + B\sin 4x)$ [Option ID = 27127]

3. $e^{-4x}(A\cos 3x + B\sin 3x)$ [Option ID = 27130]

4. $Ae^{-4x}\sin 3x$ [Option ID = 27129]

Correct Answer :-

- $Be^{-3x}\sin 4x$ [Option ID = 27128]

67) From the following conditions, which are necessary for a function $f(x)$ to be derivable at a point $x = a$ of its domain?

I. $f(x)$ is well defined at $x = a$

II. $\lim_{x \to a} f(x)$ must exists

III. $f(x)$ is continuous

IV. $f(x) \neq 0$ at $x = a$

[Question ID = 6778]

1. I and II [Option ID = 27103]
2. III and IV [Option ID = 27104]
3. I, II and III [Option ID = 27105]
4. I, II and IV [Option ID = 27106]

Correct Answer :-

- I, II and III [Option ID = 27105]

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68) The maximum slope of the curve $-x^3 + 6x^2 + 2x + 1$ is

[Question ID = 6782]

1. 19 [Option ID = 27121]
2. -13 [Option ID = 27122]
3. 14 [Option ID = 27119]
4. 16 [Option ID = 27120]

Correct Answer :-

- 14 [Option ID = 27119]

---

69) The relationship between number of beers consumed (x) and blood alcohol content (y) was studied in 16 male college students by using least squares regression. The following regression equation was obtained from this study: $y = -0.0127 + 0.0180x$. The above equation implies that

[Question ID = 6800]

1. each beer consumed increases blood alcohol by 1.27% [Option ID = 27191]
2. each beer consumed increases blood alcohol by an average amount of 1.8% [Option ID = 27193]
3. each beer consumed increases blood alcohol by exactly 0.018 [Option ID = 27194]
4. on average it takes 1.8 beers to increase blood alcohol content by 1% [Option ID = 27192]

Correct Answer :-

- each beer consumed increases blood alcohol by an average amount of 1.8% [Option ID = 27193]

---

70) The simplified expression of $(x + y)(x + z)$ using boolean algebra is

[Question ID = 6849]

1. $x + yz$

[Option ID = 27390]

2. $x + x(y + z)$

[Option ID = 27388]

3. $x(1 + yz)$

[Option ID = 27389]

4. x

[Option ID = 27387]

Correct Answer :-

- $x + yz$

[Option ID = 27390]

---

71) The general solution of $y' = 2^{x-y}$ is

[Question ID = 6786]

1. $2^{-x} + 2^{-y} = c$

[Option ID = 27135]

2. $2^x - 2^y = c$

[Option ID = 27138]

3. $2^x + 2^y = c$

[Option ID = 27137]

4. $2^{-x} - 2^{-y} = c$

[Option ID = 27136]

Correct Answer :-

- $2^x - 2^y = c$

[Option ID = 27138]

---

72) The differential equation $y'' + y = 0$ satisfying $y(0) = 1$ and $y(\pi) = 0$ has

[Question ID = 6785]

1. a doubly infinite family of solutions [Option ID = 27134]
2. no solution [Option ID = 27133]
3. a unique solution [Option ID = 27131]
4. a singly infinite family of solutions [Option ID = 27132]

Correct Answer :-

- no solution [Option ID = 27133]

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73) Suppose that the economic order quantity for an inventory problem was first calculated to be Q^*. Then it is found out that the ordering cost would be lower than anticipated. Without recalculating the economic order quantity, what can you say about the relationship between the new Q^* ($=Q^*$new) and the original Q^*?

[Question ID = 6827]

1. inconclusive without knowing how much the ordering cost decreased [Option ID = 27302]

2. $Q^* > Q^*$new [Option ID = 27301]

3. $Q^* < Q^*$new [Option ID = 27300]

4. $Q^* = Q^*$new [Option ID = 27299]

Correct Answer :-

- $Q^* > Q^*$new [Option ID = 27301]

74) Let the life time of the system follows exponential distribution and the MTBF of the system is 30 hours. Then the reliability of the system for 100 hours is

[Question ID = 6829]

1. $e^{(100 \times 30)}$
   [Option ID = 27309]
2. None of these
   [Option ID = 27310]
3. $e^{(-\frac{100}{30})}$
   [Option ID = 27307]
4. $e^{(-100 \times 30)}$
   [Option ID = 27308]

Correct Answer :-

- $e^{(-\frac{100}{30})}$
  [Option ID = 27307]

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75) If $f(x) = x^5 - 20x^3 + 240x$, then $f(x)$ is

[Question ID = 6779]

1. monotonically decreasing everywhere
   [Option ID = 27107]
2. monotonically decreasing on $(0, \infty)$
   [Option ID = 27108]
3. monotonically increasing only on $(-\infty, 0)$
   [Option ID = 27110]
4. monotonically increasing everywhere
   [Option ID = 27109]

Correct Answer :-

- monotonically increasing everywhere
  [Option ID = 27109]

---

76) If one of the eigen values of the matrix A is 3, then the other two eigen values are

$$A = \begin{bmatrix} 2 & -2 & 3 \\ -2 & -1 & 6 \\ 1 & 2 & 0 \end{bmatrix}$$

[Question ID = 6776]

1. 2 and 5 [Option ID = 27097]
2. 2 and -5 [Option ID = 27095]
3. 3 and -5 [Option ID = 27096]
4. 3 and 5 [Option ID = 27098]

Correct Answer :-

- 3 and -5 [Option ID = 27096]

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77) The 8-bit binary representation of $(100)_{10}$ is

[Question ID = 6850]

1. 0110 0100 [Option ID = 27391]
2. 1000 0000 [Option ID = 27392]
3. 0100 0100 [Option ID = 27394]
4. 0000 0100 [Option ID = 27393]

Correct Answer :-

- 0110 0100 [Option ID = 27391]

---

78) The characteristic equations of a (3×3) martix P is defined as
$a(\lambda) = |\lambda I - P| = \lambda^3 + \lambda^2 + 2\lambda + I = 0$.
If I denotes identity matrix, then the inverse of matrix P will be

[Question ID = 6777]

1. $-(P^2 + P + I)$
[Option ID = 27101]

2. $P^2 + P + 2I$
[Option ID = 27099]

3. $-(P^2 + P + 2I)$
[Option ID = 27102]

4. $P^2 + P + I$
[Option ID = 27100]

Correct Answer :-

- $-(P^2 + P + 2I)$
[Option ID = 27102]

---

79) Dynamic loading refers to

[Question ID = 6851]

1. loading a routine only when it is called [Option ID = 27396]
2. loading multiple routines dynamically [Option ID = 27395]
3. loading multiple routines randomly [Option ID = 27397]
4. none of these [Option ID = 27398]

Correct Answer :-

- loading a routine only when it is called [Option ID = 27396]

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80) The Bolzano Weierstrass theorem states that [Question ID = 6789]

1. every infinite bounded subset of real numbers has a limit point [Option ID = 27147]
2. a finite set has no limit points [Option ID = 27148]
3. None of these [Option ID = 27150]
4. a set may or may not have limit point [Option ID = 27149]

Correct Answer :-

- every infinite bounded subset of real numbers has a limit point [Option ID = 27147]

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81) In a certain code, EXECUTIVE is written as TCIEUXVEE. How is MAUSOLEUM written in that code? [Question ID = 6762]

1. AUEUOSEMN [Option ID = 27041]
2. AUUCOSLMN [Option ID = 27040]
3. LSEUOAUMM [Option ID = 27039]
4. SLUEOAUMM [Option ID = 27042]

Correct Answer :-

- LSEUOAUMM [Option ID = 27039]

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82) In a summary of five numbers, which of the following is not used for data summarization? [Question ID = 6808]

1. the mean [Option ID = 27224]
2. the median [Option ID = 27225]

3. the 25th percentile [Option ID = 27226]
4. the smallest value [Option ID = 27223]

Correct Answer :-

- the mean [Option ID = 27224]

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83) Dual linear problem is used when [Question ID = 6833]

1. primal linear problem has several constraints and less number of decision variables [Option ID = 27326]
2. primal linear problem has several constraints [Option ID = 27324]
3. primal linear problem has many decision variables [Option ID = 27325]
4. primal linear problem has constraints [Option ID = 27323]

Correct Answer :-

- primal linear problem has several constraints and less number of decision variables [Option ID = 27326]

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84) Which of the following is not nature of arrivals state in queuing system? [Question ID = 6836]

1. Explosive state [Option ID = 27337]
2. Steady state [Option ID = 27335]
3. Dead state [Option ID = 27338]
4. Transient state [Option ID = 27336]

Correct Answer :-

- Dead state [Option ID = 27338]

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85) Which of the following statement is correct? [Question ID = 6774]

1. there is no vector space of dimension 1 [Option ID = 27087]
2. there is one and only one basis of a vector space of finite dimension [Option ID = 27089]
3. any three vectors of a vector space of dimension 3 are linearly independent [Option ID = 27088]
4. if a non-zero vector space is generated by a finite set , then can be generated by a linearly independent subset of [Option ID = 27090]

Correct Answer :-

- if a non-zero vector space is generated by a finite set , then can be generated by a linearly independent subset of [Option ID = 27090]

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86) Which of the following is true of the null and alternative hypotheses? [Question ID = 6801]

1. it is possible for both hypotheses to be true [Option ID = 27197]
2. it is possible for neither hypothesis to be true [Option ID = 27198]
3. exactly one hypothesis must be true [Option ID = 27195]
4. both hypotheses must be true [Option ID = 27196]

Correct Answer :-

- exactly one hypothesis must be true [Option ID = 27195]

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87) Which one of the following error is handled by the operating system? [Question ID = 6852]

1. power failure [Option ID = 27399]
2. lack of paper in printer [Option ID = 27400]
3. all of these [Option ID = 27402]
4. connection failure in the network [Option ID = 27401]

Correct Answer :-

- all of these [Option ID = 27402]

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88) Linear programming model is based on the assumptions of [Question ID = 6823]

1. certainty [Option ID = 27285]
2. proportionality [Option ID = 27283]
3. additivity [Option ID = 27284]
4. all of these [Option ID = 27286]

Correct Answer :-

- all of these [Option ID = 27286]

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89) If all observations in a set of values are same, then the variance of the values is [Question ID = 6811]

1. zero [Option ID = 27235]
2. not possible to calculate [Option ID = 27238]

3. infinity [Option ID = 27237]
4. one [Option ID = 27236]

Correct Answer :-

- zero [Option ID = 27235]

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90) A multiple-choice test has 30 questions wherein there are 4 choices for each question. A student who has not studied for the test decides to answer all the questions randomly by guessing the answer to each question. Which of the following probability distributions can be used to calculate the student's chance of getting at least 20 questions right? [Question ID = 6812]

1. poisson distribution [Option ID = 27240]
2. uniform distribution [Option ID = 27242]
3. exponential distribution [Option ID = 27241]
4. binomial distribution [Option ID = 27239]

Correct Answer :-

- binomial distribution [Option ID = 27239]

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91) A system composed of two active redundant components each having availability equal to "A". The availability of such a system is equal to

[Question ID = 7154]

1. $1 - (1 - A^2)$ [Option ID = 28609]
2. $1 - (1 - A)^2$ [Option ID = 28610]
3. A^2 [Option ID = 28607]
4. $1 - A^2$ [Option ID = 28608]

Correct Answer :-

- $1 - (1 - A)^2$ [Option ID = 28610]

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92) The 2's complement of the number 1101101 is

[Question ID = 6848]

1. 0010011 [Option ID = 27386]
2. 0111110 [Option ID = 27384]
3. 0110010 [Option ID = 27385]
4. 0101110 [Option ID = 27383]

Correct Answer :-

- 0010011 [Option ID = 27386]

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93) The octal equivalent of $(111010)_2$ is

[Question ID = 6853]

1. none of these [Option ID = 27406]
2. 81 [Option ID = 27403]
3. 71 [Option ID = 27405]
4. 72 [Option ID = 27404]

Correct Answer :-

- 72 [Option ID = 27404]

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94) The probability of an outcome

[Question ID = 6802]

1. equals the sample mean divided by the sample standard deviation [Option ID = 27202]
2. equals M.N, where M is the number of occurrences and N is the population size [Option ID = 27200]
3. is the number of times that the outcome occurs in the long run [Option ID = 27199]
4. is the proportion of times that the outcome occurs in the long run [Option ID = 27201]

Correct Answer :-

- is the proportion of times that the outcome occurs in the long run [Option ID = 27201]

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95) The binary integers that are formed by finding 1's complement and adding 1 to it are called

[Question ID = 6843]

1. 2's complement [Option ID = 27365]
2. 3's complement [Option ID = 27363]
3. 1's string [Option ID = 27366]
4. 1's complement [Option ID = 27364]

Correct Answer :-

- 2's complement [Option ID = 27365]

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96) The diagonal elements of a skew Hermitian matrix are

[Question ID = 6794]

1. are reals [Option ID = 27170]
2. are all unity [Option ID = 27168]
3. are all zero [Option ID = 27167]
4. are purely imaginary [Option ID = 27169]

Correct Answer :-

- are purely imaginary [Option ID = 27169]

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97) The basis for ABC analysis is

[Question ID = 6835]

1. none of these [Option ID = 27334]
2. Pareto's 80-20 rule [Option ID = 27333]
3. Interests of materials manager [Option ID = 27331]
4. Interests of the top management [Option ID = 27332]

Correct Answer :-

- Pareto's 80-20 rule [Option ID = 27333]

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98) The mean of a distribution is 23, the median is 24, and the mode is 25.5. It is most likely that the distribution is

[Question ID = 6809]

1. symmetrical [Option ID = 27228]
2. negatively skewed [Option ID = 27230]
3. asymptotic [Option ID = 27229]
4. positively skewed [Option ID = 27227]

Correct Answer :-

- negatively skewed [Option ID = 27230]

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99) The points of inflexion of normal distribution curve are [Question ID = 6805]

1. $\pm\mu$

   [Option ID = 27214]

2. $\pm\sigma$

   [Option ID = 27213]

3. $\sigma \pm \mu$

   [Option ID = 27211]

4. $\mu \pm \sigma$

   [Option ID = 27212]

Correct Answer :-

- $\mu \pm \sigma$

  [Option ID = 27212]

100) A cube, painted yellow on all faces is cut into 27 small cubes of equal size. How many small cubes are painted on one face only?
[Question ID = 6765]

1. 6 [Option ID = 27052]
2. 12 [Option ID = 27054]
3. 1 [Option ID = 27051]
4. 8 [Option ID = 27053]

Correct Answer :-

- 6 [Option ID = 27052]