Department of Statistics & Operations Research
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STAT 145
First Midterm Examination
Second Semester1432 – 1433 H

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- Mobile Telephones are <u>not allowed</u> in the classrooms.
- Time allowed is **<u>90 Minutes</u>**.
- Answer all questions.
- Choose the nearest number to your answer.
- WARNING: **Do not copy answers from your neighbors. <u>They have different questions forms.</u>**
- For each question, put the code (**<u>Capital Letters</u>**) of the correct answer in the following table beneath the question number. **<u>Do not use pencils or red pens</u>.**

1	2	3	4	5	6	7	8	9	10
B	B	C	B	A	D	B	A	D	B
11	12	13	14	15	16	17	18	19	20
C	A	D	B	A	B	B	D	B	A
21	22	23	24	25	26	27	28	29	30
C	A	C	C	A	D	B	A	C	A

Question 1:

1. Which of the following is an example of a statistic:

A)	the population variance	B)	the sample median	C)	the population mean	D)	the population mode

2. Which of the following are examples of measures of dispersion:

A)	the median and the mode	B)	the range and the variance	C)	the parameter and the statistic	D)	the mean and the variance

Question 2:

For a sample of 60 women having children, we measure the age (in years). Complete the following table to give the values of the items mentioned:

Class Interval	True class Interval	Midpoint	Frequency	Relative Frequency
15 - 24	14.5 – 24.5	19.5	3	0.05
25 - 34	24.5 – 34.5	29.5	**D**	0.20
35 – 44	34.5 - 44.5	**C**	18	**F**
A	44.5 – 54.5	49.5	15	0.25
55 - 64	**B**	59.5	**E**	0.20

3. The value of A:

A)	40.5 – 50.5	B)	44 - 54	C)	45 - 54	D)	44.5 – 54.5

4. The value of B:

A)	40.5 – 50.5	B)	54.5 – 64.5	C)	54 - 64	D)	44.5 – 54.5

5. The value of C:

A)	39.5	B)	28.5	C)	29	D)	59

6. The value of D:

A)	9	B)	10	C)	11	D)	12

7. The value of E :

A)	0	B)	12	C)	10	D)	11

8. The value of F:

A)	0.30	B)	0.15	C)	0.35	D)	0.25

Question 3:

If the number of visits to the clinic made by 8 pregnant women in their pregnancy period is:

12 15 16 12 15 16 12 14

Then,

9. The type of the variable is:

A)	continuous	B)	ordinal	C)	nominal	D)	discrete

10. The sample mean is:

A)	11	B)	14	C)	8	D)	15

11. The sample standard deviation is:

A)	4.012	B)	-2.450	C)	1.773	D)	2.524

12. The sample median is:

A)	14.5	B)	15.5	C)	16.5	D)	15

13. The coefficient of variation is:

A)	70 %	B)	2.5 %	C)	28.25 %	D)	12.66 %

14. The range is:

A)	11	B)	4	C)	6	D)	28

Question 4:

Suppose that we have two events A and B such that: $P(A) = 0.4$, $P(B) = 0.5$, $P(A \cap B) = 0.2$

15. The probability $P(A \cup B)$ is:

A)	**0.7**	B)	0.4	C)	0.5	D)	0

16. The probability $P(A \cap B^C)$ is:

A)	0.51	B)	0.20	C)	0.40	D)	0.60

17. The probability $P(A|B)$ is:

A)	0.51	B)	**0.40**	C)	0.20	D)	0.30

18. The events A and B are:

A)	disjoint	B)	dependent	C)	equal	D)	**Independent**

Question No. 5

A group of people is classified by the amount of fruits eaten and the health status:

Health Status \ Fruits Eaten	Few (F)	Some (S)	Many (M)	Total
Poor (B)	80	35	20	135
Good (G)	25	110	45	180
Excellent (E)	15	95	75	185
Total	120	240	140	500

If one of these people is randomly chosen give:

19. The event "(eats few fruits) and (has good health)", is defined as.

A)	$F \cup G^c$	B)	$F \cap G$	C)	$F \cup E$	D)	$S \cup E$

20. $P(B \cup M)$ =

A)	**0.51**	B)	0.0.28	C)	0.27	D)	0.04

21. $P(G \cap S)$ =

A)	0.48	B)	0.36	C)	**0.22**	D)	0.62

22. $P(E^C)$ =

A)	**0.63**	B)	0.37	C)	0.50	D)	1

23. $P(G \mid S)$ =

A)	0.6111	B)	0.2200	C)	**0.4583**	D)	0.36

24. P(M | E) =

A)	0.6111	B)	0.2200	C)	**0.405**	D)	0.36

Question No. 6

The following table shows the results of a screening test evaluation in which a random sample of 43 subjects with the disease and an independent random sample of 28 subjects without the disease participated:

	Disease confirmed (D)	Disease not confirmed ($\bar{D}$)
Positive test (T)	38	10
Negative test ($\bar{T}$)	5	18

25. The probability of false positive of the test is:

A)	0.3571	B)	0.2083	C)	0.7916	D)	0.2173

26. The probability of false negative of the test is:

A)	0.3571	B)	0.7826	C)	0.2173	**D)**	0.1163

27. The sensitivity value of the test is:

A)	0.2173	B)	0.8837	C)	0.6429	D)	0.3571

28. The specificity value of the test is:

A)	0.6429	B)	0.3571	C)	0.2173	D)	0.2535

Suppose it is known that the rate of the disease is 0.113,

29. The predictive value positive of the a symptom is:

A)	0.9797	B)	0.5714	C)	0.2397	D)	0.34591

30. The predictive value negative of the a symptom is:

A)	**0.9795**	B)	0.5714	C)	0.2397	D)	0.34591