

END OF MARCH TEST 2019

SENIOR FIVE

APPLIED MATHEMATICS

P425/2

Duration: 1.5 hours

Attempt all questions

1. (a) These are results of S.5/2019 students obtained from a test marked out of 100.

52, 61, 78, 49, 47, 79, 54, 58, 62, 73 and 72

Find the:

- (i) Median mark. (02 marks)
(ii) Semi – inter quartile range. (04 marks)
(iii) Range of the distribution. (01 mark)

- (b) For a particular set of data, $n = 100$, $\sum(x - 50) = 123.5$ and $\sum(x - 50)^2 = 238.4$. Find the:

- (i) Mean of x . (02 marks)
(ii) Standard deviation of the distribution. (05 marks)

2. (a) A cyclist starting from a point A travels 0.2km due North to a point B at a constant speed of 5ms^{-1} . He rests at B for half a minute and then travels 300m due south to a point C at a constant speed of 36kmh^{-1} .

- (i) Find the average speed for the whole journey. (03 marks)
(ii) Determine also the average velocity for the whole journey. (02 marks)
(iii) Sketch a displacement – time graph for the cyclist's journey. (02 marks)

- (b) Three points A, B and C on a motor racing track are such that B is 1km beyond A and C is 2km beyond B. A car moving with uniform acceleration takes 1 minute to travel from A to B and 1.5 minutes to travel from B to C. Find its uniform acceleration and the speed it has at C. (05 marks)

3. (a) Tests are carried out on three machines A, B and C to assess the likelihood that each machine will produce a faulty component. The results are summarized in the table below.

MACHINE	FAULTY	NOT FAULTY
A	30	120
B	20	80
C	50	150

A component is chosen at random from those tested. Find the probability that the component chosen is;

- (i) from Machine A, (01 mark)
 (ii) a faulty component from Machine B, (01 mark)
 (iii) not faulty or is from Machine C (03 marks)

(b) Two fair cubical dice are thrown simultaneously and the scores multiplied. If $P(n)$ denotes the probability that the number n will be obtained;

- (i) Calculate $P(25)$, $P(4)$ and $P(14)$, (05 marks)
 (ii) If $P(t) = \frac{1}{9}$, find the possible values of t . (02 marks)

4. (a) A force vector $\mathbf{F} = a\mathbf{i} + 12\mathbf{j}$ has a magnitude of 13 units. Find the two possible values of a and the corresponding inclination of \mathbf{F} to the x - axis. (04 marks)

(b) Express the following vectors in the form $x\mathbf{i} + y\mathbf{j}$, given their magnitudes and directions as bearings. (08 marks)

VECTOR	MAGNITUDE (UNITS)	DIRECTION (BEARINGS)
d	7	060°
e	14	$N45^\circ W$
f	18	270°
H	6	$S35^\circ W$

END