

**MOI UNIVERSITY**

OFFICE OF THE DEPUTY VICE CHANCELLOR

(ACADEMICS, RESEARCH & EXTENSIONS )

UNIVERSITY EXAMINATIONS

 2017/2018 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER EXAMINATION

FOR DIPLOMA

 IN

 INFORMATION TECHNOLOGY

**COURSE CODE:** DIT 027

**COURSE TITLE:** MATHEMATICS FOR TECHNOLOGISTS

**DATE :**  1ST SEPTEMBER, 2017 **TIME:** 2.00 A.M – 4.30 P.M

**INSTRUCTIONS TO CANDIDATES**

* SEE INSIDE.

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MOI UNIVERSITY

SCHOOL OF INFORMATION SCIENCES

DEPARTMENT OF INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION TECHNOLOGY

END OF SEMESTER EXAMS – YEAR II SEMESTER II

2017/2018 ACADEMIC YEAR - SEPTEMBER 2017 EXAMINATIONS

DIT 027: MATHEMATICS FOR TECHNOLOGISTS

Time: 2 hours 30 minutes

Instructions to candidates

* Section A is compulsory
* Answer any two questions in section B

**SECTION A – COMPULSORY: ANSWER ALL QUESTIONS (30 MARKS)**

**QUESTION 1**

1. Factorize the following expressions: (8 mks)
2. x2 + 7x + 12
3. 3x2n10x – 8
4. 8rr – 10rt + 3t2
5. 8t2 – 50a2
6. Solve for x given that: (6 mks)
7. Log10­ (2x - 1) + 2 = log10 (3x + 4)
8. Log2 (5x) – log4 (2x) = 3
9. Simplify the following expressions completely: (6 mks)
10. $\sqrt{98}$ + $\sqrt{12}$ - $\sqrt{50}$ + $\sqrt{32}$ -$\sqrt{48}$
11. (5a-2b)-3
12. Out of 21 typists in an office, 5 use (M)annual typewriters, (E)lectronic typewriters AND (W)ord Processors; 9 use (E) and (W); 7 use (M) and (W); 6 use (M) and (E); but no one uses (M) only.
13. Use M, E and W to denote appropriate sets, represents the above information in the form of a Venn diagram (2 mks)
14. The same number of typists use (E) as use (W). How many use (W) only? (2 mks)
15. How many typists use (E) (2 mks)
16. What is the probability that any 1 person selected is able to use only 1 type of machine?

 (2 mks)

1. What is the probability that any 2 persons selected can both use word processors?

 (2 mks)

 **SECTION B- ANSWER ANY TWO QUESTIONS (20 MARKS EACH) QUESTION 2**

1. The table below shows the distribution of marks scored by 40 students in mathematics.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Marks  | 1- 10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 |
| Frequency | 3 | 4 | 2 | 5 | 8 | 11 | 2 | 1 | 3 | 1 |

Calculate:

1. The modal class (2 mks)
2. Median class (3 mks)

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1. Mean mark (5 mks)
2. Standard deviation (5 mks)
3. Convert to degrees (5 mks)

**QUESTION 3**

1. If a die is thrown once, find the probability of getting: (5 mks)
2. If tan θ = a show that:

 Cos θ sin2 θ + Cos 3 θ = 1 (5 mks)

 Sin θ a

1. Simplify 1 (5 mks)

 $\sqrt{(x}$2 – a2) where x = a Cos θ

1. Derive the quadratic formula using the following general quadratic equation

 ax2  + bx + c = 0 (5 mks)

**QUESTION 4**

1. If a die Is thrown once, find the probability of getting: (8 mks)
2. An even number or a 3
3. 3 or less
4. Not more than 2
5. At least 5
6. A boy throws a fair coin and a regular tetrahedron with its four faces marked 1,2 ,3 and 4. Find the probability that he gets a 3 on the tetrahedron and a head on the coin. (3 mks)
7. Two marble are drawn in turn from a pack containing 3 red marble, 6 white marbles, 7 black marbles and 9 green marbles. Determine the probability of drawing:
8. A black then a green marble without replacement. (3 mks)
9. Two white marbles with replacement. (3 mks)
10. Using a tree diagram, find the probability of getting 4 tails after tossing a fair coin. (3 mks)

**QUESTION 5**

1. Write the following in logarithm form (6 mks)
2. 91/2 = 3
3. bn = m
4. evaluate the following: (6 mks)
5. 40!/36!
6. 7c5 x 9c6
7. In an arithmetic progression, the thirteenth term is 27, and the seventh term is three times the second term. Find:
8. First term (2 mks)
9. Common difference (3 mks)
10. Sum of the first ten terms (3 mks)

**======END=====**

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