

ST. AUGUSTINE -TAGASTE SECONDARY SCHOOL

FORM FIVE HOME PACKAGE

18th March- 17th April 2020

ADVANCED MATHEMATICS

INSTRUCTIONS

1. This paper consists of **THREE** questions.
2. Answer **ALL** questions. Use **A₄** papers out of that will not be marked.

1. (a) Find the sum of the first n terms of the following series:

i. $\frac{1}{3 \times 6} + \frac{1}{6 \times 9} + \frac{1}{9 \times 12} + \dots$

ii. $\frac{1}{3 \times 4 \times 5} + \frac{1}{4 \times 5 \times 6} + \frac{1}{5 \times 6 \times 7} + \dots$

(b) Evaluate the following in Binomial coefficients.

i. $\binom{-5}{3}$ ii. $\binom{\frac{1}{5}}{2}$ iii. $\binom{-1}{\frac{6}{3}}$

(c) Expand the following in ascending powers of x , as far as the term in x^3

i. $\frac{1}{\sqrt{2+x^3}}$

ii. $\sqrt{2-x}$

(d) Obtain the first four terms of the expansion $(1+8x)^{\frac{1}{2}}$ in ascending powers of x . By putting $x = \frac{1}{100}$ obtain the value of $\sqrt{3}$ correct to 5 decimal places.

2. (a) Differentiate the following with respect to x

i. $y = (x^2 + 1)\sin x$

ii. $x^2y^2 + 5xy + x^3 + 2yx = 44$

(b) If $y = \sqrt{\frac{1 + \sin x}{1 - \sin x}}$ show that $\frac{dy}{dx} = \frac{1}{1 - \sin x}$

(c) Find derivative of $y = 2x + 1$ from the 1st principle.

(d) The distance x metres travelled by a car in t seconds after the brakes are applied is given by $x = 25t - 2.5t^2$. Find

i. The speed of the car (in km/h) when the brakes are applied.

ii. The distance the car travel before it stops.

3. (a) i. $\int (x+3)(2x^2 + 6x) dx$

ii. $\int \frac{x+5}{x(x+3)} dx$

iii. $\int \frac{dx}{\sin x + \cos x}$

(b) i. $\int e^{ax} \sin bx dx$.

ii. $\int e^{ax} \cos bx dx$.

(c) i. Find the area enclosed between the curve $x^2 - 4 = y$ and $y = 4 - x^2$

ii. Find the volume of the solid generated by revolving the region bounded by $y = x^2 + 2$ and $y = x + 4$ about x -axis.

iii. Find the volume of the solid of revolution generated by revolving about x -axis the region under the curve $y = \sqrt{r^2 - x^2}$ from $x = r$ to $x = -r$.

ST. AUGUSTINE -TAGASTE SECONDARY SCHOOL

FORM FIVE HOME PACKAGE

18th March- 17th April 2020

BASIC APPLIED MATHEMATICS

Combination PCB/HGE

INSTRUCTIONS

1. This paper consists of **THREE** questions.

2. Answer all questions.

1. (a) if $f(x) = x^2 - 3x + 4$ find $\frac{dy}{dx}$ from the first principle.

(b) Find the stationary values of the curve and distinguish them:

$$y = \frac{x^4}{3} - \frac{3x^2}{2} + 2x - 4$$

(c) If the amount equation for a manufacturing product is $d(x) = 200 - 0.3x$. Find the marginal Revenue Function and evaluate it when $x=100$.

(d) (i) Differentiate $\sqrt{x^2 + 1}$ from the 1st principle.

(ii) If $y = \sqrt{\frac{x}{2}} + \sqrt{\frac{2}{x}}$ prove that $2xy \frac{dy}{dx} = \frac{x}{2} - \frac{2}{x}$

2. (a) Solve $\int (\cos 3x) \sin^{10}(3x) dx$

(b) Solve $\int_{\frac{\pi}{6}}^{\frac{\pi}{4}} (5 - 2 \sec x \tan x) dx$

(c) (i) Find the area between $y = x^2 - 1$ and $y = x + 1$ from $x = 0$ to $x = 3$

(ii) Find the area enclosed by the curve $y = x^2 - 4$ and $y = 4 - x^2$

(d)(i) Find the volume of solid of revolution by the curve $y = x^2$ from $x = 0$ to $x = 2$ about y-axis

(ii) Find the volume of the solid generated by revolving the region bounded by $y = x^2 - 2$ and $y = x + 4$ about x-axis

3. (a) Given the data 3,5,8,6,2,3,8,5,10. Compute:

- i. P_{20} and P_{70}
- i. Q_1 and Q_3
- ii. $I.Q.R$

(b) The result of the weight of potatoes obtained from each of 100 roots are summarized below:

Weight of potatoes roots (in kg)	0-3	3-6	6-9	9-12	12-15	15-18
Cumulative frequency	9	31	59	80	97	100

Find:

- i. Mode
- ii. Median
- iii. Mean by coding method
- iv. Stand deviation and variance by coding method
- v. $I.Q.R$
- vi. 40th percentile

ST. AUGUSTINE -TAGASTE SECONDARY SCHOOL

FORM FIVE HOME PACKAGE

18th March- 17th April 2020

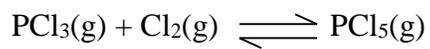
CHEMISTRY

INSTRUCTIONS

1. Answer **ALL** questions.
2. Write your work in **A4** paper.

QUESTIONS

1. Alkene A(C₁₆H₁₆) on ozonolysis gives only one product B(C₈H₈O). Compound B on reaction with NaOH/I₂ yields Sodium benzoate. Compound B reacts with KOH/NH₂NH₂ yielding a hydrocarbon C (C₈H₁₀). Write the structures of compounds B and C. Based on this information two isomeric structures of alkene A can be proposed. Write their structures and identify the isomer which on catalytic hydrogenation (H₂/Pd-C) gives a racemic mixture.
2. Give reasons for the following observations:
 - a) Benzene is extraordinarily stable though it contains three double bonds?
 - b) Benzene undergo electrophilic substitution reactions easily and nucleophilic substitutions with difficulty?
 - c) Acidic behavior of the compounds: n-hexane, benzene and ethyne decreases in the order: H-C≡C-H > C₆H₆ > C₆H₁₄.
 - d) Alkynes undergo nucleophilic addition reactions while simple alkenes do not?
 - e) Addition of HBr to propene yields 2-bromopropane, while in presence of benzoyl peroxide the same reaction yields 1-bromopropane.
3. A compound "X" (C₂H₄O) on oxidation gives "y" (C₂H₄O₂) which undergo iodoform reaction. On treatment of X with HCN, compound Z is formed, which on hydrolysis gives 2-hydroxyl propanoic acid.
 - i. Write down structures of X and Y.
 - ii. Name the product when X reacts with dil. NaOH.
 - iii. Write down the equations for the reactions involved.
4. At a certain temperature, 1 mole of PCl₃(g) and 2 moles of Cl₂(g) were placed in a 3.0 litre container. At equilibrium. Only 0.7 mole of PCl₃(g) remained. Calculate the value of the equilibrium constant for the reaction:



5. 1.0 mole of N_2O_4 is placed in 5 litre vessel at 100°C . Part of it dissociated to form NO_2 and at equilibrium 1.0 mole of NO_2 is present. If total pressure is 1.2 atm.
- Calculate the pressure constant K_P .
 - Derive the relationship between K_C and K_P for the reaction: $\text{N}_2\text{O}_4 \rightleftharpoons 2\text{NO}_2$

ST. AUGUSTINE -TAGASTE SECONDARY SCHOOL

FORM FIVE HOME PACKAGE

18th March- 17th April 2020

BIOLOGY

INSTRUCTIONS

1. This paper consists of sections **A** and **B** with a total of **ten (10)** questions.
2. Answer **ALL** questions in section **A** and **two (2)** questions from section **B**.
3. Except for diagrams that must be drawn in pencil, all writing should be in blue or black ink.
4. Write your **Name** every page your answer sheet.

FOR EXAMINER'S USE ONLY		
QUESTION NUMBER	SCORE	SIGNATURE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
TOTAL		

This paper consists of three (3) printed pages

SECTION A (70 Marks)

Answer **all** questions in this section. Each question carries **ten (10)** marks.

1. Explain the process of urea formation and removal.
2. (a) Why should the diameter of mitochondria remain fairly constant when the length is so variable?
(b) Name four chemical substances which are involved in respiration which would enter the mitochondrion from the cytoplasm and four which would leave.
(c) The volume of air exchanged in the alveoli is in fact less than that of the pulmonary ventilation. Suggest why this is the case.
3. (a) What do you understand by the term taxonomic key as used in biology?
(b) Explain how to construct and use a dichotomous key.
(c) State one characteristic of the class to which the wheat plant belongs in reference to each of the following:
 - (i) Leaf morphology
 - (ii) Stem anatomy
 - (iii) Seed morphology
 - (iv) Root morphology
 - (v) Stem anatomy
 - (vi) Flowers
4. (a) Explain why synaptic convergence should increase visual sensitivity.
(b) Explain in your own words why objects are seen more clearly at night by not looking directly at them.
(c) Give two reasons why there is a sudden influx of sodium ions into the axon following an increase in sodium ion permeability of the axon membrane.
5. (a) What is taxonomy?
(b) State three problems that face taxonomists.
(c) Discuss three advantages and three disadvantages of natural system of classification.
6. (a) Discuss three properties of lipids.
(b) Write short notes on compound lipids.
(c) What do you understand by the term 'chitin'?

7. (a) Discuss the causes and prevention of constipation.
(b) Explain the fate of PGAL after it has been made in the Calvin cycle.

SECTION B (30 Marks)

Answer **two (2)** questions from this section.

Each question carries **fifteen (15)** marks.

8. (a) Draw a large, well labeled diagram of a chloroplast of higher plants.
(b) How is the chloroplast's structure related to its functions?
(c) (i) What are lysosomes?
(ii) Briefly elaborate on the roles of lysosomes in organisms.
9. (a) Why does the lactic acid level in the blood continue to rise after exercise when anaerobic respiration has ceased?
(b) The rate of uptake of oxygen increases immediately exercise starts. How is the supply of oxygen from outside the body to the cells increased during exercise?
(c) Construct a table showing the major differences between photosynthesis and aerobic respiration.
10. Using diagrams and one example in each case, classify bacteria on the basis of their morphology.

ST. AUGUSTINE -TAGASTE SECONDARY SCHOOL

FORM FIVE HOME PACKAGE

18th March- 17th April 2020

GEOGRAPHY

INSTRUCTIONS:

1. Answer **ALL** questions.
2. **ALL** writings should be in **BLUE or BLACK** ink, except diagram which must be in pencil.
3. A work which is not written by yourself will not be marked.
4. Be neat and clear, dirtiness of any kind will result to loss of marks.
5. Write your work in **A4** papers.
6. Attach this question paper with your work.

QUESTIONS

1. a). Explain five (5) characteristics of population census.
b). Describe four (4) merits and four (4) demerits of census.
2. Briefly describe the following concepts as used in geography:
 - i. Fecundity
 - ii. Vital registration
 - iii. Child women ratio
 - iv. Ageing population
 - v. Natural population change.
3. Explain seven factors influencing climate of a particular area.
4. The table below shows the mean annual percentage frequency of wind direction and wind speed. Study it carefully and then answer the questions that follow:

Wind speed /direction	N	NE	E	SE	S	SW	W	NW
< 4mph	1.3	3.2	2.6	3.4	2.2	4.6	2.0	3.6
4-12mph	2.4	4.0	3.1	2.8	2.7	4.4	3.5	2.5

12-24mph	1.6	4.5	3.6	3.9	1.4	3.7	1.0	2.1
>24 mph	0.8	2.5	2.6	1.5	0.8	3.4	0.3	1.0
Total	6.1	14.2	11.9	11.6	6.1	16.1	6.8	9.2

- i. Display the data above by means of compound wind rose.
- ii. What are the merits and demerits of using this method in presenting data.

5. Study carefully the data below in the table and answer the questions that follow.

Class interval	Frequency
0 - 4	4
5 - 9	11
10 - 14	36
15 - 19	54
20 - 24	21
25 - 29	9
30 - 34	1
35 - 39	4

- i. Find the range of grouped data.
- ii. Calculate the standard deviation.
- iii. What are the advantages and disadvantages of range given geographical data?

6. With the aid of diagrams distinguish the following geographical terms:

- i. Atoll reef and mud flats salt.
- ii. Soil texture and soil pH.
- iii. Discordant drainage system and trellised drainage pattern.
- iv. River capture and ephemeral river.
- v. Artesian well and kame terrace.

ST. AUGUSTINE-TAGASTE SECONDARY SCHOOL

FORM FIVE HOME PACKAGE

9th June, 2019 – 7 July, 2019

PHYSICS

INSTRUCTIONS

1. Answer **ALL** questions.
2. Write your work in **A₄** paper.

1. (a) Explain each of the following in terms of rotational dynamics;
 - i. It is easier to loosen a nut on the bolt using a long spanner than using a short one.
 - ii. An ice-skater spins more easily while her arms folded than when her arms stretched.
 - iii. In hand –driven grinding machine, handle is put near the circumference of the wheel or stone.
 - iv. Spokes are fitted in the cycle wheel

(b) i. Define radius of gyration.

ii. Radius of gyration of a body about an axis at a distance 8 cm from its centre of mass is 12 cm. Find its radius of gyration about a parallel axis through its centre of mass.

2. (a) Given $Y=2\cos \pi(0.5x_{-200t})$

Find (i) Amplitude

(ii) Frequency

(iii) Time

(iv) Wavelength

Where y and x are in cm and t in Seconds

(b) A progress wave is represented by the equation $y= 20\sin (1000 \pi t - \frac{\pi x}{51})$

when t is in second and y in cm, Find.

- i. Amplitude a ,
- ii. Wavelength λ
- iii. Frequency f

iv. Period T

Derive the progressive wave equation especially for the wave which is travelling from right to the left.

3. (a) State the Stefan's law.
(b) Calculate the energy radiated in one minute by a black body of surface are 200cm^2 maintained at 127°C . Stefan's Constant = $5.7 \times 10^{-8} \text{Wm}^{-2}\text{K}^{-4}$
(c) Two absolute scales A and B have triple points of water defined to be 200A and 350B. what is the relation between T_A and T_B ?
4. (a) State and explain Kirchhoff's laws.
(b) Fig 2.1.29 shows an electrical circuit. Assuming the internal resistances of the cells are negligible, calculate the current through each resistor

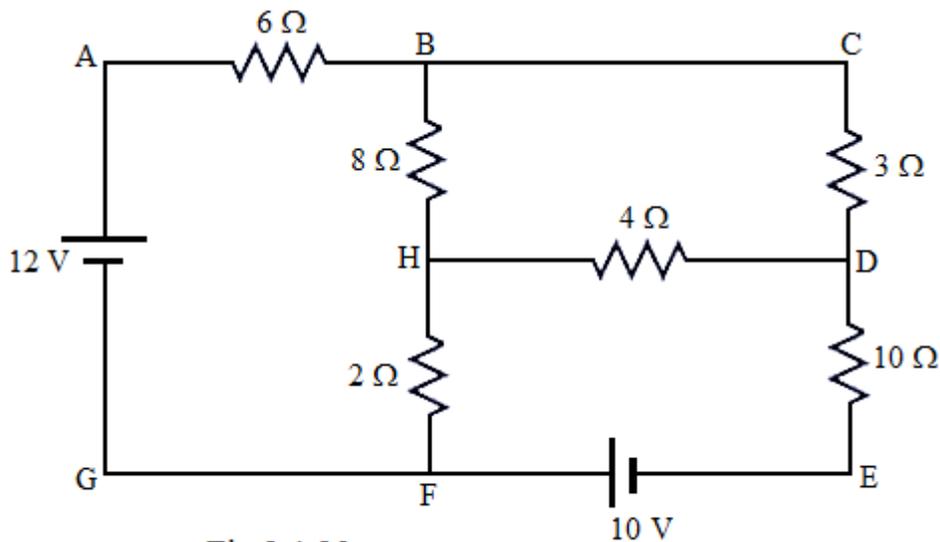


Fig.2.1.29

5. (a) State and explain Brewster's law
(b) When a beam of light of wavelength 780 nm is incident on the surface of a liquid at an angle 56° the reflected light is completely polarized. Determine the wavelength of the reflected ray in the liquid.

ST. AUGUSTINE -TAGASTE SECONDARY SCHOOL

FORM FIVE HOME PACKAGE

18th March- 17th April 2020

GENERAL STUDIES

INSTRUCTIONS

1. This paper consists of **THREE questions**.

2. **Answer only TWO questions.**

1. Analyze six philosophical ideas of Karl Marx on elimination of capitalism.
2. Analyze six reasons for the development of liberal philosophy in Tanzania.
3. Describe six aims of the structural Adjustment policies (SAPs) toward the restructuring of African economies in the mid 1980's.
4. Most of Tanzanians especially youth do engage in social media and tend to post pictures and videos against the cyber crime Act of 2015. As an educated youth of Tanzania explain six offences under cyber crime Act 2015, and suggest five ways of protecting from cyber crime.
5. With example, discuss six impacts of deadly pandemic disease COVID-19 in social and economic development world wide.

ST. AUGUSTINE - TAGASTE SECONDARY SCHOOL

FORM FIVE HOME PACKAGE

HISTORY

17th March -17th April, 2020

INSTRUCTIONS

1. Answer **ALL** questions in A4 papers

QUESTIONS

1. Analyze six roles of the impacts of the 1919 Versailles treaty in the rise of African nationalism and the struggle for independence.
2. Compare and contrast the level of development of science and technology between African and European societies in the 15th century.
3. Marine technology played a big role in the widening of the gap between African and Western Europe from the 15th century. Comment with six points.
4. Discuss the main factors that facilitated the rise and development of the Nyarubanja system in west lake region in Pre- colonial African (six points).
5. The feudal mode of production did not develop in the entire African continent. Account for the variations (Give six points).
6. “Settler agriculture legalized land displacement between the two races in favour of the foreigner” In light of this statement explain how the implementation of this system affected the natives. Provide six points

ST. AUGUSTINE -TAGASTE SECONDARY SCHOOL

FORM FIVE HOME PACKAGE

18th March- 18th April 2020

ECONOMICS I

INSTRUCTIONS

- **Answer all questions**
- **Use A4 Paper**

1. Write short notes on the following economics concepts,
 - i. Spill- over effects
 - ii. Spill – over benefit
 - iii. Externalities
 - iv. Positive consumption externalities
 - v. Negative consumption externalities
 - vi. Positive production externalities
 - vii. Negative production externalities
 - viii. Producer – Consumer externalities
 - ix. Consumer – Production externalities
 - x. Free riding
2. Highlight eight factors which influence compensation differential in the economy.
3. Is full employment implies zero unemployment? Discuss
4. Show the applicability of Keynesian theory of unemployment in Less Developed Countries like Tanzania.
5. Study carefully the following table and answer the questions that follow;

YEAR 1				YEAR 2		
Goods	Price	Index	Weight	Price	Index	Weight
A	2.00	100	4	2.50	125	4
B	5.00	100	2	6.00	120	2
C	1.00	100	1	0.8	80	1
D	3.00	100	3	6.00	200	3

Determine;

- i. The weighted index of prices for the year 1 and 2
- ii. The percentage change in the weighted index over the period
- iii. The change in the value of money on goods over the periods
- iv. Provide economic interpretation on your answer from part (iii) above.

6. Propose six possible solution that a country can adopt to control externalities in the economy.
7. Discuss six upswings and down swing of the level of economic activities.
8. Giving five points, explain the importance of the environment economics.
9. Write short notes on the following concepts;
 - i. Voucher privatization
 - ii. Bottom – up Privatization
 - iii. Asset sale privatization
 - iv. Share issue Privatization
 - v. Leasing
 - vi. Service shedding
 - vii. Hire- Purchasing
 - viii. Market failure
 - ix. Quantity theory of money
 - x. Loanable Fund theory of interest
 - xi.

10. Given

$$TC = 20Q^2 + 4Q + 2000$$

$$TR = 1000Q + 8$$

Where;

TC = Total cost

TR = Total revenue

Q = Quantity of output

Calculate;

- i. Total variable cost function
- ii. Total fixed cost
- iii. Marginal cost function
- iv. Level of output which firm maximize profits
- v. Profit at a maximum output.

ST. AUGUSTINE -TAGASTE SECONDARY SCHOOL

FORM FIVE HOME PACKAGE

18th March- 17th April 2020

ENGLISH LANGUAGE

INSTRUCTIONS

Answer ALL questions in this paper

1. Using relevant examples, describe eight factors to prove that Kiswahili is an international language.
2. Use eight points to support the view that in order to improve the students' competence in Tanzanian Secondary Schools, Kiswahili Language should be used as the medium of instruction.
3. (a) Write a phonetic description for the final sound in each of the following words:
 - i. Lamb
 - ii. Rough
 - iii. Breeze
 - iv. Public
 - v. collapse
- (b) Using each of the following words, explain how stress can be used to identify and distinguish two words whose spellings are identical:
 - i. Content
 - ii. Invalid
 - iii. Present
 - iv. Minute
 - v. Compact

4. Write the technical term given to the word formation strategy in each of the following sentences.
 - i. Expanding the original meaning of a word.
 - ii. Repetition of a word or part of a word.
 - iii. Replacing the original meaning of a word.
 - iv. Using a word as a different part of speech.
 - v. Limiting the original meaning of a word.
 - vi. Formation of words from scratch (or nothing).
 - vii. Changing the order of two adjoining sounds in a word.
 - viii. Removal of an affix from the existing word.
 - ix. Shortening an existing noun to produce a new verb.
 - x. Taking a word from one language into another with or without modification

5. Analyze the relevance of two novels you have studied under this section, to the contemporary world using four points each