TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MATHEMATICS & PHYSICS

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN BUILDING AND CIVIL ENGINEERING (DBCE YISI)

APS 2100 PHYSICAL SCIENCE FOR ENGINEERS

END OF SEMESTER EXAMINATION

SERIES:AUGUST 2019

TIME:2hours HOURS

Instructions to Candidates
You should have the following for this examination
-*Answer Booklet, examination pass , student ID,Scientific calculator and no mobile phones,*
This paper consists of five questions. Attempt **any THREE questions**.
Maximum marks for each part of a question are as shown
This paper consists of **FIVE** printed pages

Do not write on the question paper.

Question ONE
(a)(i)Distinguish heat from temperature

(ii)Explain the three basic ways of heat transfer.

(iii)Define the principle of conservation of energy

(iv)sand falls from a hopper 7m above the ground.find the kinetic energy per kg

.   of sand 1m above the ground

(10mks)

(b)Define and or explain the following

(i)Moment of inertia

(ii)Theorem of parallel axis

(iii)The terms friction and moment of a force

(iv)An electric motor producing a torque of 800NM is used to drive a drill.Calculate the force on the cutting edge of a 12mm diameter drill

(10mks)

Question TWO

(a)State at least five characteristics physical properties of matter

(5mks)

(b)Define and or explain the following terms as applied to mixtures

(i)suspensions

(ii)solutions

(iii)Colloids

(3mks)

(c)Distinguish between weight of a body and its mass

(2mks)

(d)Define and or explain the following terminologies

(i)Condensation

(ii)Density

(iii)Sublimation

(iv)Vaporization

(v)Freezing

(5mks)

(e)(i)A rectangular object is 3,0 cm long,2.0 cm wide and 1.0 cm deep. The object
. 　　has a mass of 4.0g.what is its density?

　　(ii)How many liters of water are in 234cm^3

(5mks)

Question THREE

(a)Define the following terms as applied in dynamics

　(i)Mass

　(ii)Weight

　(iii)Force

　(iv)Momentum

　(v)Impulse

(10mks)

(b)A pile driver of mass 1000kg falls through a distance of 24m and is brought to 　.
.　rest in 1/10s.Calculate the average force it exerts on the pile

(6mks)

(c)A train from rest accelerates uniformly atr 2m/s^2 .Calculate:-

　(i)Its velocity after 15s

　(ii)The time taken to reach 40m/s

(4mks)

Question FOUR

(a)State,define and or explain the following as applied in electricity

(i)Dynamo effect

(ii)Motor effect

(iii)Potential difference (p.d) unit 'volt'

(iv)Electrical power derived from electrical energy

(v)Heating effect of a current

(10mks)

(b)Six resistors are connected in parallel

GroupA,R1=6Ω,R2=14Ω,R3=26Ω(In parallel)

GroupB,R4=12Ω,R5=8Ω(In parallel)

GroupC,R6=5Ω(In parallel

Group A,Group B and Group C are then connected in series .Calculate:-

(i)The supply voltage if the power dissipated in R6 is 20W

(ii)The power in the 6Ω Resistor

(iii)The current in the 12Ω Resistor

(10mks)

Question FIVE

(a)Define the terms

(i) Substance

(ii)Mixture

(iii)Compound

(iv)Mass Number

(v)Redox-reactions

(10mks)

(b)(i)State some five properties of ionic compound that makes ionic bond a strong . .   one.

   (ii)Write and draw the electronic structure of sodium atom and bromine with 11 .   and 25 electrons respectively

   (iii)Explain the term periodic table and show a rough sketch of its group and .   . .   period scenerios.

(10mks)