

Moral TEST # 2 (iii) Solar Gnergy: letar energy applies energy from the sun in the mattin to generate electricity. sole form of solar radiation for heat or to generate electricity. solar powered electricity generation uses either photovoltaics or heat engines - A partial eist of solar power applications includes space heating or wolling through polar architecture, day ughting, solar wolking and high temperature heat for industrial processes. (iv) Biomans and Biofuels: Bromass and propuels are nightfront renewable energy cources in Paliestan due to country's substantial agricultural base and the availability of organic waste materials. Paliestan produces large quantities of coop residues such as oneal straw, sile bigercane, maize, with shally can be used for power generation - Similarly with a significant lives to de population Palistan has ample arimal manure that can be converted to bloggy through an crobic digestion. lillewise, waste from agro industries such as food procening and pulp and paper can be converted into enlogy. (V) Geothermal Energy: Hot water and stean from deep underground can be used to drive turbines: called geomermal energy. Several types of rollis contain radioactive substances such as uranium, the devoy of these radioactive sub rances release hear energy, which (e warms up the rocks. These cocks then heat the water and pererales steam. This steam can be used to drive tubines and electricity gineration. POLICY OPTIONS TO OVECOME ENERGY CRISIS (iv In the yest-changing global toends, there are nimerous opputurities for Palitistan to find a solution to its energy coizes

(1) Rescarh and Derelopment: first and foremost ophion, the other states, Palvistan needs to impose proper rules and regulations regarding the operating hours of industries. Our think tarks and research centers should publish research aires and policy papers that are Palishorn - The centric untaining "robust implementation mechanisms" considering local challenges. Paristan needs to compare all energy related "institutions' needs under a single ministry, which will create efficiency in a dysfunctional energy sector and the whole sector will be streamlined (it) Envesting in Renewable Energy Industry: Similarly, if is a golden chance for local and overcas rerewable energy program novestors to invest in Palietan which the government of Paliston has given on Alternate and Penewaldle Energy Policy is 2019. This is updated version of reprivable energy policy for Development of Power Generation in 2006. Importing dian coal des expensive than imported all Palistan and gay, will allow Palitan to diversify its energy mix. should develop ways to make it casies for survenies toget loans and investments for bioman and bioput projects. and work for funding from international organizations the green climate Pund Include Bioman and Bibliel in Energy Plans: : 2200 (chi) Patriston should also improve energy security by uning bioman and biopuels to reduce reliance on inpursed fuels It should also whilit birman energy projects to enaile jobs and imporove energy acces is sured areas Train people and Raise Awareness: (iv) Conducting training programs for formers, technicians, and entrepreneurs on growing crops and making motivels and months



compaire meducale prople about its benefits, atyppoliting from a practices that increase biomans praduction by promoting instance the practices can bead to color obergy cases is if habitan. aut (b): Structure of SUN : Sun is a star. A star is a nuge ball of gas, meetly hydrogen and habitan. Nuclear forsion medican insule the size means enormary ensance of energy. I have they are very had and give of their own light. Evidential source insule the size interme main regione. Bun and instruction medican insule the size into three main regione. Sun And interior twe ever almosphere. United surface of can lies believen interior and almogenere. Sun's interior twe ever almosphere. Here are three main parts of sub interior: The core is the cut the anter of the surface of the hotes? The core is the cut the anter of the surface for about 25. On house is considered to ever the form cut to about 25. Of the sector realises. As density is more that produce he density of useles. Star is in a cut the cut of the surface for about 25. Of the sector realises. As density is more that produce he density of useles. Star is an only second of the land produce he density of useles. Star is the only second of the land produce he density of useles. Star realises. Is density is more that produce he density of useles. Star is the only second of the land produce he density of useles. Star realises. Is density is more that produce he density of useles. Star realises. Is density is more that produce hered through fusion. The angle of the land produce hered through fusion. The angle of the in the produce hered			
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Chromos phere Gé Rodiative tomes con Neepin 2000 Ø Radiation Care tone 0 Shadea orea B Photosphere core monit Fig 1 - Structure of the sun. part(c): CERAMIC MATERIAL : A chamic is an inorganic non-metallic solid made up of Elay that have been shaped then hardened by heating to high temperatures. Ceramics are all around us They include tile, bricks, plates, gran, and toilers Properties exhibited by aramic malerials: 1 They are hard, extremely strong, showing connelerable stiffnen under compression and bending Ceramics are wear resistant and durable and thus used in industry. 2-3- ceramics are refractory material with high mething pour used to live the inside walls of furnale. These are consiston revision. 4 aranies are here to themical action and generally donot reach 5with most liquidy gases and anders. Ceramics are oridation - rest and. 6-Ceramics are thermal and electrical insulators except for 7. some certain ceramics which conduct electricity like chronium divide and most metals

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STRUCTURE OF HUMMAN RAFE: Can ceramics be recycled? Yes, ceramies con be recycled but the poncess is more complex compared to merals and plastic due to their properties Methods: beronnies con be recycled: methody By following Crushing and grinding Ralling in new products 3 - Thermal procerning : AND AND Memods of Re-Thermal processing Cycling Ceramics Crushing and E Grinding (i) collection and Indudes : sorting be in New Products (i) contection (ii) Calination Indudes: (ii) sorting (iii) Sinfering (i) Collection & Sorting (iii) Crushing - 1 stratenin (ii) Refubrication (iv) Grinding part (d): Our ears are h-charge of collecting ounds, procerning them, and this wind signals to brain. Also may help keep the balance. Sending Outer 10,000 Middleear maller onductor can als -se Ne (to brain) Cochlea Earcanal 201 drum Eustachian pibe 99M1. SAN higune: Structure of Humon Ear. I I I I I WILL 0.

STRUCTURE OF HUMAN EQ.R: 2 babyog- ad whomen and The ear is made up of three sections: The order ear, the middle ear and the innerease. These parts work together no we can hear and procen different sounds. The outer and inner middle ear noticitives are involved in hearing only while the inner ear is responsible for equilibrium and hearing. (1) OUTER EAR: Mennels of Re-(i) The outer ear connists of an outer, furnel-like structure called the auricle (or pinna) and an S-shaped pube called the external anditory mearus or auditory conal. (ii) The anniles of the ear hups to wallest sound waves to coverling promph air and directs them into anditory meature. (iii) Sound waves eventually his the sympanic memborane (or eardram)the boundary between order and middle earrs. making the earrdrum vitgrate which the pormfirs sound energy to time bones of middle ear. (PA) MIDDLE EAR: 1) Middle ear consists of an air-filled pace having three small bones called and iton onsides this indude - the mallers (normer), incus (amil), and strupes (stimup) A Eustaction tribe (auditory tube) connects middle ear to l(i)the thoat which allows the air to pain between the tympanic with and outside of the body and maintain equal ar prentice on hom sides of eardran which is in worldn't for normal hearing (3) INNER EAR: higher: Structure of Human Ear. (i) The inner ear ironnists of a complex system of inter-communicating

he Kill Traviel chambers and tube called labyonth. (ii) The parts of labyring include a capier that fonctions in hearing and three seri-crailar isnally (and lor, posticion and lalial) that finction is providing a serve of equilibrium. A (iii) A body chamber called when located welther countra child in what's workains mean among smallines that here with hearing and equilibrium ntains pringmph that have the shift elastic (iv) The when fibres vibre non entering the pertingent cause movements in these movements fibres os citra they generate a menage that is no sent to the brain through auditory nerve. DUESTION NO. 05 portia) ARTIFICAL INTELLIGENCE ADMILLE PORTAGENO THE DESIGNAL Artificial intelligence is a branch of computer science foured on unaling systems capable of performing tasks that typically require hypomitilelligence. These fastes trickede problem-Dolwing learning understanding, recognizing patterny and making accisions. There are different types of antificial indeligence (AC): (i) Namon AI: It is also knewn as weak AI. It is designed end trached for a specific Park, like facial recognition or Danpuage tranlation. Most of AI we werder today is panow AC. General AE: It is smong AE; repending to a machine with (ii)the ability to understand dearn and apply interrigen across a wide range of Passes, similar to human incargence. Alexa the AI model is an example.

(iii) Superintelligent AL: 96 refers totani AL mab sur passes the human Enterligence autoscall fields - Origen the chainstances, it is we are more likely to be Wooduced with superintelligent AL.

Our technology has advanced significantly within the last decade and there are many accomptishmed's though we would have comidered impossible - one of these accomptishments was made by Apple with the lownen of SIRI a vietnal assistant created to aid those using Apple products - u SIRI has voice recognition technology that allows if to listen to an individual and respond accordingly. On order to for AE to take over such important aspects of our society they would have the gump though numerous ways that are much more challenging one might expect.

Examples of AL oursmarting tumons : UNIDENEDTING AND AND

Af outsmanted humans in specific tasks, For example, Af systems have bearen humans at chess, Go, and Jeopardy. They have also been used to develop self-drining cars and medical diagnostic systems.

In 2016, an Al system called Apphago defeated the world changnion Go player, lee sedel. This was a major breakthrough as Go is considered to be much more complexing i gave then chess-

In 2017, an AL system alled Watson won the jeopardy 1quit show. Watson was able to deplet two human champions by using its vast knowledge base and its ability to wo learn and a dept.

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As AG technology continues to evolve, It's likely man machines will become incaringly capable of outsmarring

humans But only in specific tasks in a suger ward Analysis: different ways while AI and human intelligence excels of processing vast amounts of data gualy and identifying patterns that numars may overlook, human inselligance brings creativity enotional intelligence, and a rical printing stills to be talde. Simparty, runars and AL do of speak the same language even prough ne have created user that allow us communicate the we are bying to achieve - misse are unarguably complex but as we dig deeper the algorithms and the they impail the flow of why around in an individual and, we can see the true asmplisity and challenges of would face before reaching to and point where it would out small us ! Cubrusive Molecench: part (b) Row FORMATION : Roch is any otherent, naturally becaring so tid materials consisting of one or more mineraly. They form through tanions geotogical processes over million of years. The formation I rolly is injurned by different factors ruch as temperature, pressure and preserve of chemical substances. Roy CYCLES fremicel: The well y de à a contrans process making orango formanion of nocus as mey change the noch cycle helps to explain now rocks are formed from other no des. I is depined as the time consuming transhions through geologic time among

three main roll sypes: redimentary metainomphic and igneous-The vocu cy cu le driven by two forces: Earth's internal heat which moves material around in the core and manifile and leads to the slow boul righticant changes within the Crust and The hydrological cycle, which is the movement of water, ice and (2) air as the surface and is provered by the sun. STACLES INVOLVED IN ROUL CYLLE : Magnartormation of Igneous Rodes: Magma & molton will beneath the Earth' Durface. when it cools and solidifies, it forms igneous rocks. Intrusive (Plutonic): Those gnious ordes which are formed beneath the surface (granite rock) Extrusive (voluenic): Those igneous rales which are formed as the surface (e.j.; Dasaet) The ignians roulis can be broken down into realments Roy formented: through witheing and errosion. 2- Formation of sedimentary Rolles: Sediments are broken small parts of an existing rock. They are branquisted and deposited in layer. Over time, these layer are compatiled and cemented to form redimentary rocks. clastic: Those redimentary makes formed form weathering debris (l.g. sandstone). - chemical: These realimentary oxcles formed from drisselfied minutes precipitating from celution (e.g., inestone) - Organic: Those sed merry news formed from the accumulation of plant or a mail detrois (e.g. coal). Sedimentary rocus can be buried and subject to hear and prenue leading to melamorphism yours it moid and and

'n Lund Mutamorphic Rocks formation: When existing rocky (igneous or sectionalogy) undergo milato infense hear, premue, or churnically monphism due active fluids, metamorphic rocks are formed. milamorphic rollis have a bonded or foilated : These layered appearance (e-9; schist) Non-foilated: These melamorphic rocks donot have a layered appresance (e g ; marble). Metamorphic rocky can mell and her become magner and relycling the cycle (Ochline Magma nuti 5. 1 OUNCOS Rock Cyaz Milamorphie Igneausndy allond Sedimentary erosion WROUPLIN morshim Routs Address all par TYPES OF ROCKS : equallv METAMORPHIC SEDIMENTARY IGNEOUS ROCUS: Roces: Rocks: -formed from existing formed from compacto Formed from wooling and solidification of and cementation of rocks transformed by sediments. hear and prossure magma or lava. Examples: Examples: Examples : Sandstone (Clasti) - Schrisf (Foliated) Grante (Intrusive conestone (Chemical) - morble (Non-foliated) Basalt (Latrusive coal (Organic)

	parico (2) indoneration:
-	CARBONYDRATES :
	Corbohydrates are the birmolecules and himon's key sorriet of 1007 energy, providing 3-9 calories of energy per gram. When corbohydrates are broken down by the body, glucose Listing when produced. Corbohydrates are organic companies, these ampose of only corbon, hydrogen and organs the hydrogen : argan raho is usually 2:1 - The englished formula of cabohydralles is Cm(H2O)n. Corbohydrates one airo known as sacchardes - word from Grack and calchronth, meaning sugar. Corbohydrates is Corbohydrates are available in wide variety of foods, like: cireals, fruits (especially dates), honey, mille, sugarheel,
	potato, passa and sugarane. Finchions of consolvy drales:
2-3-	Carbonyarales are a chief energy some its many animals. Guilose is broken down by glycolysis / kerbs cycle to yield ATP. If is stored as glycogen in animals and starchin plants. Hored corbonydeales and in regulation of neare tissue and is melerergy forme for the brainfield and and show of mean to
1 -	the energy toka for the black of with upids and proteins to Controlydrales get anoched with upids and proteins to form surface artigent receptor molecules at vitaments and antituotics.
S-	They peticipate in biological transport, cell-cell communication
6-	Inese use notrich fibre content: and thelp to prevent unit

CLASSIFICATION OF CARBOHYDRATES 01 Types Carbohydrates complex Simple constrydates Carbohy cloals Monosachhendes Oligosachhandes Potysachhundes Starch > Sucrose > Gucose Glycogen > Lactose > Garactore Homo Cellulosc: polysaching Maltose > microsc > Pechin > Hyannomicacid fletono-- Monosachhandes polysachmides These are often walled as simple singues. They are simple sugar and connol be hydroly 200 MMARKING Originated from Greek word mono = one and sakknon = sugar. Their general formula is Con (H2O)0 The menosachtranides are rulodivided into trioses, terrore pense, herose, heptose elc. Gramples: Guesse: The innediate cova - levergy for cellular repriation and "blood Galactose: A M Ir in mill and youquer. Fructose: A sugar found in honey. : relying Oligosachhandes: 2-Nome poly sauchardes: Heknonowssachhoridus: In Green, oligo means, sfew -Oligosachhenieles or

Oligosachhoroses are compound sugars i that yield 2000 100 12010 molecules of some or different monosachtronides in hydrodysis-Oligosachhandes yielding 2 malecules of mono sachhonides hydrolysis is known as dio suchhande Oligosachhendes yielding 3 to 4 monosachhonides are known as trisachhorides or terrarachhorides, respectively Their general formula is Cn (H2O) n-1 for drasachharide and for trisachhanides and so Cn (H2D) n-2 Two monosachhenides can be littled together to form a double suger or diasachheride Examples: Sucrose: common Table night = Glucoze + Auctose Lactose: Major sugar is mille = Glucose + Galactose Maltose: Product of Harch digestion = Glucose + Glucose Add diagrams and POLYSACMUARUDES: 3! structures In Green, poly means "nany"- Polyrachhandles are the compound rugars and yield more than 10 molecules of mono sach harides on hydrolysis Polysachhardes are purcher damified depending on me type of molecules produced as a result of hydroly sis. Nomo polysachparides monosachhenides of same (ii) Keteropolysachandes ie, monosachhoridus à diff cal types. Their general formula is (Ge H1005) Examples: (1)Nomo poly sachhard aloce Pechnill Storch, Glycogen, Methopolysachhorides: Hydurome and windowith. (2)

Odv[14]	Disease Prevention:
pari(d):	The poly of the second se
BARANGED DIE	The water of where the work new Marine Marine had
	the pool man as los problems and us pought with
A balanced	dier is a dier which includes night anon
of all mut	vients such as proteins, vitamins, miteraly,
fors, who	marates ele- for progre growth, development
and norma	tynutioning of the body included and the
A balanced dier	to required for the growth of and development
of a person especi	ally the children.
	Calbonydrales: our main
(Components of	Balanced dier:) source of energy.
ynn	Proteins: essential to growt
	Fats: 10 00 0000 00 muscles and the
	Fats: 1010 of energy and important for b
ne de la companya de la compa	Vitamins: me in hemical processes in the body
I Inpresa	Us: inorganic elements critical to body's normal function of human body is walk and so necessary for
Water: 65-7	al body functioning.
BENEFITS OF	B PAPANCED DIET :
Numitional Ade	quacy: 11-Marrozz
A balanced die	ensures adequal intake of energial numeros
such as vitaming,	minerals, proteins, carbout parales, fails and Un
fiber neurony	for proper functioning of the bigdy. Consuming a
vorriery of poods	helps prevent nutrient deplacencies which can have
lead to various bo	
	<u>i entral petruliation a téluici</u>
	not: and can be added a state
Early metrent -	dence foods and controlling portion nizes can

3 - Disease Prevention: A paranuel diet nich in fruite, vegetaldes, whole grains, proteins end hearthy fars can lower the vish of choice as a ruch as cordionas unlar problems, shoke, respectionsion and certain sypis of cancer. Is also ensures a strong imme system, happing the body defend against infections and illnesses. 4- Lonproved Digestion: A baland diel mal includes prenty of fiber from print vegelardes and legumes promotes healthy digertion and regular bowel movements. comming out food supports a diverse gul microbiota which anibritated with better overall health and reduced misk of gastrointestinal divider. : 265-1 57 Energy and stamina: Conning balanced meals and mark's margharef. The day provides a steady supply opening man helping menutain and productionty. I and supports physical :performine and endusance in daily opposites as well as exercise and mosts. PERMERTIS OF BARRICED DIET SECTION-I : Waysout A turition of A GUESTION NO. 06 parica): Initial population = 18 000 After a decade final population = 22500 manuar maise Duranon = 10 years. Increase in population = final population - Initial population = 22500 -18000

Marcase in population after 10 years = 4500 Potal invare in pop. Perensage in per year = x 100 Inhal population Perentage increase ryear = 1500 × 100 18000 25% 100 00 5 3 Formulation Percentage increase inpopulation = 25-1 over 10 years par(b): Les the units made in 12 days be = x Units machines Days 600 9 20 X V 1 1/18 12 600 = 9 × 20 = 5 18 K 12 x 5x = 600 x 6 = 3600 \Rightarrow x = 3600 3 x = 720 units By wring direct proportion method, 720 units can be made in 12 days by 18 machines Doub (0). J-SUPIO car Distance = d = 450m Corr Pime = t = 1 minute = 60 seconds : (b) In Prain distance de= 69km = 69000 m Train time = ty = 45 minutes _ 2700 seconds

1. 38

let the speed of corbe ve and train be ve. Using formula for speed: V= d + where v= speed, d= distance, t Calculating speed for car: Nc = dc = 450m = 7.5m/s ta Gos Calculating speed of train: $v_t = dt = 69000m$ = 25.Sm/s 27005 halfulating ratio Vc : Vt : (di Tun Vc = 7.Smls Vt stimb Dr mist Days =) Vc = 10,294 NE converting meratio to simple form by eliminating derinals using eq () 7.5 = 875/19124 CTEND = 195 NC = 25.5 255/10 84 VE = 750 VC Vt 2550 => 750:250 = 1: 3.4 Vc: Vt ≈ 1:3.4 3 Thus the meed of train is 3.4 times more than car: Iw part(d): Each side of perfagon = 15 cm Number of sides = 5 In cose of pentagon

polygons. Using formula for perimeter of palipagens: Perimeter = number of sides & length of each ride Perineter = limeter = 75cm Perimeter of pentagon with booth of each side usin is 75cm. MESTION NO.08 part(a): $B \longleftrightarrow Q 17$ 2 > R (D 18 4 0 (---). 9 7 15 19 Te 20 14 H <--> N 8 -> Q . GITX UN 5 FE 18 $R \longleftrightarrow A$ 1 (1 Ram Assigning the specific numbers for alphabets we can see in B a there is a shift of 15, in R a D the shift is of 14, in Org, there is shift of 8, Tes S shipt of 1, HON implies shipt of 6, men E co a have shift of 12 and R (A has stift of 17 -Noting the specific trend for the word SISTER, we will follow the same termique: S first with a shift ofthe 104 (19)shift of -14 -> (26) (9) ĩ shift of -8 (11) (19)S T shift $q - 1 \rightarrow (19)$ (20)shift of $6 \rightarrow$ shift $f = 12 \rightarrow$ E (5) (11) (30 R (18)

For positive shifts: alphabers having members greater than to tal momber of alphabels i.e., 26, we'll take mod of that number with 26. $S(19) + 1S : 19 + 1S = 34 = 34 \mod (26) = .8$ R(18)+12: \$8+12=30 => 30 mod (26)=4 For negative shifts to be positive, add + 26. S(1) I(9) - 14 = -5 + 26 = 21> (8) (19)S < 1011.0 (9) I < Now incorporating ? () () (11) (K (19) S e eeters with number - $\rightarrow (19) \leftrightarrow 3$ (20) T & (S) E \rightarrow (11) \leftarrow K $\rightarrow (4) \leftrightarrow D$ (18) R + Thus SistER is encoded as HUKSKD. poni() 1,2,6,21, malying the given pattern we have $1 \rightarrow 1$ 1x 1+1-)2 2×2+2-36 $6 \times 3 + 3 \rightarrow 21$ 21×4+4-788 So the next missing Tom = 88

pail(c): W E Á < 10. No. A DE 14 maring the path s : 101 [.vs. 1401 B 13pr 1-3 toff 14 pr 10c1 = |BC| = |AO| = 3P1, 1001 ma|AB| = 10ff4-01 H then, there is in the control of Amer print les x be the distance Nonseer is for from point A to D which is actually hypotenuse. Base = 1001 = 4f1 Perp = IAD = 3fl Mup = x = ? Using pypagoras meaner: (Myp) = , [Base) + (Perp)- $= \sqrt{(3)^{2} + (4)^{2}}$ = 59+16 = \25 $Hyp = Sfl = \chi$ Henry Naser is 5 f on porn A.

part (d): Average temp of a week (7 days) = 33°C Average temperature of 3 days = 30°C	
Average temp of a week (7 days) = 33°C	
Average temperature 0-3 days = 30°C	
Average temperature of less 3 days = 35°C	
Les remperature of forth day = x	-
Converting to temperatures based par day:	
Arg. temps. of weak = $33x^2 = 231^{\circ}$ C	
Avg. Comp. $q \leq 3 d a = 30 \times 3 = 90^{\circ}$ C	
Avg - lengo of Loss days = 35 × 3 = 105° ct med	
Geven the conditions, we can form an equation:	1
105°C + 90°C + x = 231°C °° (Avg. lemp of all do	
$\chi = 231^{\circ}C - 105^{\circ}C - 90^{\circ}C \qquad \qquad$	realy
$\chi = 36^{\circ}C$	
Henre,	
The lemperature on fourth day is 36°C.	