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Text with Technology

Geography

Last Minute Suggestion

[500 Most Important Key Point]

1. **James hutton (1785):-** principle *of uniformitarianism* , ***"the present is key to the past" "no vestige of beginning and no prospect of an end," "cyclic nature of earth history".***
2. **Base level of erosion :-** c.g.greenwood considered to postulated the consept before powell.
3. ***"When endogenetic force act horizontally the resultant landform is large dome shaped structure"*** this process is **warping**.
4. **Theory and authors:-**

THEORY	AUTHORS
Convectional current	Holmes(1928)
Sea floor spreading	H . hess(1960)
An outline of geomorphology	S.w. wooldrige
The unstable earth	j.a. steers
The study of landform	R.j.small
Morphology of the earth	L .c.king
Two stage theory	Demek
Radio active theory	Joly
Tetra hedral hypothesis	l. green
Bergschrund theory	d. w. johnson

5. **Masswasting** :- fragmented rock materials enblock down the hill slope under gravity also called mobile process.

   S . F = strength or sharing resistence of rock devided magnitude of sharing forces.

   - **Creeping** : down slope movement of slow velocity
   - **Sliding** : rappid rate of down movement
   - **Spreading:** lateral displacement of rock

6. **Isostasy** :- first proposed by Dutton(1859) .

   * "*uniform density with varying thickness*":- airy

   * "*uniform depth with variying density*":- pratt

7. **Bergschrund & crevasse** are moving glacier ice separate from ice.

   * It is serious obstacle for mountain tracking .

8. Excessive folding results **nappe** formation .
9. Fluvial erosional processes are corrosion ,hydrolic action , abrasion

   * (**youth** –waterfall ,rapides , pothole ,meander. **mature** : alluvial fan ,spur, oxbow lake ,**Old**: flood plain ,delta levee.)

10. **Relict mountain**: arabali ,applasian,ural.

    Block mountain: black forest, satpura,weatern ghat(angular block mountain)

11. **Moho-discontinuity** (1909): crust & mantle(depth-30km),
condrad discontinuity (1934): sial and sima(15-20km),
reptti discontinuity:upper and lower mantle(700km)
Gutenberg discontinuity(1912): mantle and core(2900km)
lehmen dicontinuity (1936): inner and outer core(5150km)

12. **Moho scale:** showing hardness of rocks (1-10,talk – 1,diamond -10).

13. **Continental drift** :Wagner explain major climatic change in his theory .His theory explained in his book "Die entstchung der continent and ozeane"(1924). Before wagner F.B. Taylor provided "horizontal displacement of continent".
*two forces responsible for drift-
i. **tidal force**(westward)-ex. N. & S. America
ii. **differential gravitational force**(equatorwad) – ex. Africa.

14. **Pangaea** drifted into – i. *angaraland*- N.America,Europe,Asia.
ii. *gondoanaland* –S.America , Africa ,India,ociania,Anterctica.

15. **Jig-saw-fit** :-geographical,geological,fosil fuel ,lemings and glosepteries flora dipersion evidence of Africa and S.America.

16. **Shifting position of the poles**:

period	N. pole
Silurian	14° N,124°W
Carboniferous	16°N, 147°W
tertiary	51°N, 153°W

17. **Plate tectonic theory**: the tram plate first used willson (1965) father of plate tectonic pichon (1968)
*paving stone hypothesis: morgan and pichon.

18. **Plate margin:-**
i) Destructive and convergent plate: continent to continent(himalaya), oceanic to oceanic : (japan island), oceanic to continent : (rocky , andis)
ii) Constractive and divergent plate : oceanic to oceanic(mid-atlantic ridge), continent to continent(great rift valley)
iii) conservative and transform plate: san andris fault.

19. **Movement of plate**: was propounded by Morgan(1967) and direction of plate first showed by Mackengy and Perker.

Plate	eurasia	N. America	S. America	antertica	africa	india	philipine
Movement (Cm/year)	N 2cm/y	sw 2.3cm/y	w	Nw 1cm/y	Ne 2.5 cm/y	Ne 5 cm/y	Nw 14mm/y

Arabian	iranian	nazca	cocos	Carribian
Nw	s	e	nne	Ne 20mm/y

20. **Geosyncline**:- long, narrow, shallow sinking in beds, mobile zone. Concept of geosyncline first introduced by J.Hall and Dana and developed by E.Haug and J.W. Evans. According to Schuchert geosyncline 3 type – Mono(appalasian), poly(rocky,ural), Meso(tethys).

* **Stages of geosyncline** : i) *lithogenesis-* sedimentation ii) *orogenesis-* squeezing and folding iii) gkiptogenesis - gradually rise mountain and denudation .

21. **Origin of mountain** : i) *geosynclinal orogen theory* of Kober, ii) *sliding continent theory* of Daly iii) *Thermal contraction theory* of Jefry , iv) *Convectional current theory* of Holms , v) *Radioactivity theory* of Joly.

***Terms of kober geosyncline** : kratogen/foreland(surrounded by rigid masses), randketten (marginal ranges), zwischengebirge/median mass (betwixt mountains) .

22. **Concept of geographical cycle**:

i) Normal/erodion/geomorphic/humid cycle (W.M.Davis) ii) Arid & Glacial & Marine cycle(Davis & king), iii) Karst cycle (Beede & Cvijic), iv) Periglacial cycle (L.C. Peltier), v) Pediplanation/Hillslope cycle(L.C.King).

23. **Concept and theory** :

i)Dynamic equilibrium theory/steady state of balance (J.T.Hack & R.T.Chorley), ii) Tectonic geomorphic model(M.Morisawa), iii) Episodic erosion model(S.A.Schumm), iv) General system theory (V.Bertalanffy,1950).

24. Penkian concept of cycle is under **open system**(Non-cyclic concept). Cycle of erosion by W.M. Davis is under **close system** (cyclic concept).

25. **k.J. Gregory Geomorphic equation** :

F=f(PM)dt [Where, F=landforms , f=function of , p= process, M=geomaterials, dt=mathematical way of denoting change over time .]

26. **classification of coast**:

i) *emerged coast*: (eastern coast of india),

ii)*subemergence coast*: ria coast(S.W. Aurland coast), dalmesian coast (Yugoslavia Adriatic sea coast), fiord coast (norwey sonje fiord),

iii) compound coast (kerala, Karnataka coast).

27. ***a littoral zone from land to sea**-

back>fore>near>off - shore.

28. **Theory of karst topography**:

i) two cycle (davis),

ii)water table (swinnerton),

iii)static water (gardner) ,

iv)invasion (malott), .

29. **Evolution of slope** :

i) slope decline theory by Davis (books- *'the convex profile of badland divideds'[1982], 'the grading of mountain slope' [1898], 'piedmont bench lands & primarumpfe'[1932])*

ii) slope replacement theory of Penck

iii)parallel retreat theory of L.C.King(*river cycle[1951], hillslope cycle[1951], landscape cycle[1962])*

iv)process response model of O.Fisher(1866) & Lehmann(1933)

v) development of hillside slope of A.Wood(1942). *he first used concept of 'constant slope' .

30. **Concept of erosional surface** :

peneplain(Davis), pediplain (L.C.King), panplain (Crickmey), panfan (Lowson), etchplain (P.Thomas), endrumpf (penck) .

31. **Difernt type of delta** :

* arcuate(po, rhone, ganga, nile,), *bird foot delta (misisipi), *cuspate (ebro, tiber) , *lobate/fan (nile, rhone),*esturine(rhine),funnel(ganga , niger , mekong).

32. **River regime:**

i)*simple*(Volga, ganga, iang-si-kiang),

ii)*two dimentional*(amajon, jaire, ob),

iii)*complex* (rhine , daniube, misisipi).

33. **Landscape of globe** :

simple –are generally devoid of complexity and result the monoprocess acting during a single cycle of erosion

compound- produced by more them one geomorphic process and landform controlling factors

monocyclic- produced a physiographic region during of single cycle of erosion

polycyclic –several cycle of erosion(chotonagpur, damodar valley, ranchi plateau).

34. **palimset topography** : means such a surface which bears the imprints of geomorphological processes during past geological periods after partially erased initial imprints in the beginig.

35. Preservation of magnetic properties is the older rocks of the either is called ***paleomagnetism***. Magnetic angle increases poleward .

36. **Type of equator** :

Equator	Deff
Magnetic equator	The imaginaryline joining the places of zero magnetic dip angle
Thermal equator	The lines which joins the points where temp. is max.
Geographical equator	the imaginary line which joins 0° lat.

37. **Defferent type of river** :

*consequent – Basistha ,paisini river in west of western ghat .

*obsequent – located in nothern slope of siwalik

*resequent –

*antecedent- Sindh , Sutlej,

* superimposed – shog, Subarnarekha

38. **Drainage pattern** :

Dendritic (godabari), rectangular (son, betwa,kane) , parallel (eastern slope of nilgiri & chotonagpur plateau), trellised (Krishna), centripetal (lopnor, chad lake area), radial (poreshnath), braided (bidyadhari), annular (middle Asian mountain region), concordant (Karnataka plateau).

39. **Theory of glacial erosion** :

glacial protection (Garwood), cyclic (W.H.Hobbs), meltwater and rainwater (Lewis), bergschrund and nivation (W.D.Johnson), periglacial (L.C.Peltier), episode erosion (schum & lichty), tectonic – geomorphic model(morisawa).

40. **Books of geomorphogists** :

Hitory of ocean basins (H.Hess), Fluvial process in geomorphology (Leopold &wolman & Miller), Fundamentals of geomorphology (Rice), The study of landforms (R.J.Small), geomorphology (Sparks), Illustration & huttonian , theory of the earth ,1802(John Play-fair),principle of geology ,The geological evidence of the antiquity of man,(Charles Lyell).

41. **Type of rejuvenation** : 3 types –

i) Dynamic (due to tectonic forces) ,ii) Eustatic (due to sea level change), iii) Ststic (due to climatic change , change of river slope ,decrease of river load, river capture).

42. **Depth of valley by impact of rejuvenation**- high in dynamic reju.

Medium in eustatic reju.

Low in static reju.

**rejuvenated landforms*- two cycle valley, knick point , truncated meander, river tarrace.

43. **Clasification of igneous rock basis of chemical properties**:

sub	Acidic	intermediate	basic	Ultra-basic
Silica(%)	65-55	65-55	55-45	<45
basic oxide(%)	<35	35-45	45-55	>55
Rock ex.	Granite, obsidian	Andesite, diorite, porphiry	Basalt, dolorite, gabro	peridotite

44. The direction of a horizontal line on an inclined rock strata is known as **strike.**

*when internal forces are active in opposite side with contraction and spreading resulted dome shaped landforms are called **wrapping**.

45. **Different type of dune** :

*_transverse/barchans_ – leeward side(steep, concave slope),windward side(genle, convex slope)

*_longitudinal/seif_ – parallel to the wind

*_parabolic_ – 'u' shaped ,coastal

*_star_ – multiple slip faces

* _Whealback_ – complex/reverse/draas

46. **Erosinal landforms of Aeolian process** :Gour/pitzfelsen(germany),Yardang/cockscomb, Zeugen, Ventifact,Dreikanter, Inselberge,Messa & butte,

47. **Type of desert** : sandy desert(Erg in sahara, kum in middle asia), rocky desert (hamada), rock partical desert (reg/serir).

*playa –salina(u.s.a),shots(sahara), bolson(mexico, western u.s.a), dhand(rajasthan)

*wadi-arroyo(spanish), wash(u.s.a), nullah(thor desert).

48. **Slope in highest to lowest order** :

summital convexity >rectilinier >free >debris>rectilinier >basal concavity.

49. **Landform developed by weathering**: regolith, saprolite, desert vanish ,Spheroidal weathering, tors, etchplain, rock sea, talus scree, duricrust.

50. **Clasification of mass wasting**(after sharpe,1935):

1) *Slow flowage* –creep(soil, rock, talus, rock glacier), solifluction
2) *Rapid flowage*- flow(earth ,mud, debris,)
3) *Landslide* -slump , debris slide, rock slide, debris fall, rock fall
4) *Subsidence*

51. **Coastal erosion** –

*sequence from land to sea (swash>transition>surf>breaker),

**erosional lanforms* :(cliff, geo,wave-cut platform,blow hole,sea cave, natural airch,cove, bite& bay, stack, stamp) & *Depositional landforms* :(beach, beach ridge, bar, spit, off shore bar, barrier beach ,hook spit ,spiral spit, cuspate spit& foreland, tombolo, lagoon, coastal dunes).

52. 'Troposphere' term was first suggested by Teisserene –de-bore.

*decrease of temp. with increasing elevation at mean lapse rate of about 6.5° c/km or 3.6° F/100ft.

53. The greek word '*Tropopause*' which literally means 'where the mixing stops '.It was sir napier show who first time used this word.

54. The atmospheric layer characterized by absorption of U.V.Radiation is called **ozonosphere**.

* The greatest concentration of ozone are found between about 20 and 25km.

55. **Homosphere**(0-88km) has 3 layer: troposphere, stratosphere, mesosphere.

Heterosphere(88-10000km) has 4 layer : molecular N2 (200km), O2 layer(1120km), Helium layer(3520km), Hydrogen (upto 10000km).

56. The insolation reaching the earth's surface is equal to 23 Billion horse power.

57. The process in which incident radiation is retained by a substans is called **absorption.**

58. The process of transfer of heat through movement of a substans from one place to another is called **convection**.

59. **Impact of Insolation**:-

Effective solar radiation(66%)	Albedo(34%)
• By atmosphere(19%) • By direct solar radiation (19%) • By clouds (23%) • By light scattering (5%).	• By earth surface (2%) • By atmosphere (7%) • By clouds (25%)

60. * Dry adiabatic lapse rate 10°C/km(DALR)

* Wet adiabatic lapse rate ranges 4°C -9°C/km(WALR)

* Normal lapse rate 6.4°C/km(NLR)

* Super adiabatic lapse rate 35°C/km(SALR).

61. *Specific heat of water =1

*latent heat of fusion(ice to water)=79-80 cal/gm.

*latent heat of sublimation (ice to gas)=680cal/gm

*latent heat of vaporization (water to gas)=540-607cal/gm

62. **Theory of cloud formation:**

* *ice crystal theory* – T.Bergeron & Findisen(1933)-applied for extra-tropical region

* *collision coalescence theory* – Simpson ,masson & E.G. Boven-applied for tropical and equatorial region.

63. **Front:-**

Front	Aveg. Slope	Cloud
Warm	1:100-1:200	Cirrus , nimbo-stratus, alto-stratus
Cold	1:50-1:100	Cumulo-nimbus

64. *The term '*cyclone*' first used by H.Pedington(1848), which means rotation in circulation.

* The 'anticyclone' term first used by F.Galton.

65. **Different type of tropical cyclone**:-

Name of cyclone	Source
cyclone	Indian sea
Hurricans	Carribian sea, 9ndian sea
Typhoons	China sea
Willy willy	South 9ndian sea
Bagui	N.w. pacific sea
Tornado	U.S.A (southern)

66. Spenish word *'tronada'* means thunderstorm. It is also caiied twistters in U.S.A.

* violent convection in conditionally and convectively unstable air column is the main cause of tornadoes development .

* 700 tornadoes are reported in an year (april through june period).

67. **Hurricanes** is found in between 10° and 15°.

*a tropical hurricane is a nearly circular vortex averaging 500-600km in diameter .

68. **Thunderstrom** originate from cumulonimbus clouds . Generally a thunderstorm has 3 -5 cells, each of which goes through a life cycle .

*<u>*conditions for origin of thunderstorm*</u> –

*atmospheric instability *lifting of potentially unstable air *large supply of warm and moist air *thickness level of cloud form condensation level upto freezing level must be about 30 meters.

69. **<u>Koppen Classification :-</u>** Koppen proposesd his first classification in 1900 using the world vegetation map.

*he revised his classification first in 1918.

70. Thornwaite presented his classification of climates in 1931 and revised classification of climate of world in 1948.

Humidity province	Vegetation	P/E index
A. Wet	Rainforest	128>
B. Humid	Forest	64-127
C. Sub- humid	Grassland	32-63
D. Semi-arid	Steppe	16-32
E. Arid	desert	<16

Temparature province	T/E index
A' –tropical	>128
B'- mesothermal	64-127
C' – microthermal	32-63
D' – taiga	16-31
E' – tundra	1-15
F' - frost	0

*Thornwaite devided total 32 climatic region in world.

71. **Tri-cellular model** first proposed by Polman(1951).

Hadley cell	0°-30°N/S	Equatorial low- extra tropical high	**Trade wind**
Ferrel cell	23 ½°-60°N/S	Extratropical high – sub polar low	Westerlies
Polar cell	60°-90°N/S	Subpolar low – polar high	Polar wind

72. The word 'Monsoon' came from arbian word 'mousin' and Malayan word 'monsin' , which means season.

*the term 'Monsoon' was first used by E.Halley.

73. **Origin of monsoon** described as-

*classical theory (E.Halley,1686), *shifting of air pressre belt –H.Flohn(1951), *Thermal engine theory-P.Koteswarem(1952), *airmass theory, *Jefrys theory.

74. **Cloud are classified** by Luke Howard (1803) into 4 type basis of shape and size .

High cloud(>20000ft)	*cirrus- mother of pearl cloud *cirro-stratus- create ice crystal *cirro-cumulas-Mackeral sky
Middle cloud(6500-20000ft)	*alto cumulas – sheep / wool pack cloud *alto-stratus- clear sky
Low cloud(<6500ft)	*strato-cumulus *stratus –horizontally spreading *nimbo-stratus –very high rainfall
Vertical cloud	*cumus- vertically growing *cumulo-nimbus – thunder cloud

75. **Principle geases comprising dry air in the lower atmosphere** :

N2(78.08%), O2(20.94%), Ar(0.93%), Co2(0.03%), Ne(0.0018%), He(0.005%), O3(0.00006%), H2(0.00005%.).

76. Albedo(%) from various surface:

Fresh snow	80-85	Forest	5-10
Old snow	50-60	Water (sun near horizon)	50-80
Sand	20-30	Water (sun near zenith)	3-5
Gases	20-25	Thick cloud	70-80
Dry earth	15-25	Thin cloud	25-50
Wet earth	10	Earth and atmosphere	35

77. ***Geostrophic wind** – above a height of 600 meters blows parallel to the isobers

***Gradient wind** – moving along the isobars that face due ti pressure gradient is balanced by deflective and centrifugal effect

78. The variation of wind with elevation thorogh in friction layer is represented by an equiangular spiral is called **Ekman spiral**.

79. **Local wind and their location** :

Hot local wind	Location
Foehn	N. side of alps
Chinook	East side of rocky
Santa ana	U.S.A.
Sirocco	sahara
Khamsin	Egypt
Simom	Asiatic & africa desert
Hermatten(doctor wind)	West Africa(gini coast)

Cold local wind	Location
Mistral	Western midenterranean
Bora	Adriatic sea
Blizzard	Anterctic region

80. **Unit of Humidity**:

*absolute humidity- gm/m3

*spefic humidity – gm/kg

*relative humidity - % (R.H.= Vapour pressure/Saturation vapour pressure *100)

81. ***Law of mixing ratio***, W = e/p-e

[where, e= vapour pressure , p = total air pressure]

82. **Forms of precipitation**:

*Rain – water partical more than 0.5mm diameter

*Drizzle – fine drops of water less than 5mm diameter

*Snow – white and opaque grains of ice

*Sleet – small translucent ice less than 5mm diameter(rain+snow)

*Hail – pieces of ice diameter ranging greater than 5 to 50mm

83. **Relative contribution of greenhouse gases to atmospheric warming**:

CO2	CH4	CFC	NO2	OTHERS
49%	18%	14%	06%	13%

84. **Contribution of selected countries of CO2 emission:**

Year	U.S.A.	China	U.K.	Japan	India
2004	22.9%	17.3%	2.1%	4.9%	4.4%
2025	16.5%	24.3%	1.5%	3.9%	6.7%

85.

Forces	Source
Pressure gradient	Wind pressure parallel with isobar
Coriolis	Earth rotation
Friction	Geographical landforms
Tidal	Gravity of moon and sun

86. **Different climative environmental treaty and agreement**:

Stockholm declaration (1972)-sweden,

**montreal protocol* (1972)– reduce of CFC to check deplation of ozone layer ,

**Vienna convention*(1985),

**Toronto summit* (1988)- reduction in emission of CO2

**Rio/earth summit* (1992)- egenda 21, UNCED,

**4th assessment report of IPCC*(2007),

**Kyoto protocol(*1997)- resolved to 5.2% cut in the emission of CO2 by devoliping countries.

87. **Height of ozonophere** in tropical (25km), extra tropical (21km), polar (18km).

Density of ozone gas – equatorial (250DU), extratropical (350DU), polar(450DU).

88. The CO2 theory of climate change was advanced by T.C.Chamberlin.

89. The number of world meterogical centres is 4 and WMO established in 1950(head quarter-Geneva).

90. **koppen devided india 9 climatic region**-

1) Amw- monsoon type with short dry winter season 2) As- monsoon type with dry season in high sun period , 3) Aw – tropical savannah type , 4) Bshw – semi-arid steppe type , 5) Bwhw- hot desert type ,6) Cwg- monsoon type with dry winters , 7) Dfc – cold ,humid winters with shorter summer, 8) Et- tundra type, 9) E – polar type.

91. **Continental Shelf:-** *extending of continent area 7.6%

*Slope 1°-3°

*width from coast- 100Fathom (180m)

Continental slope:- *extending of continent area 8.5%

*slope 5°

*width from coast 200Fathom

92. **Abyssal plain :-** *is a gentle slope <1:100.

*depth about 3300-5500m(2000-3000Fathom).

93. **Hypsometric curve :-** represent this elevation and depth points on the earth surface with reference to sea level (sealevel used as datum).

94. The position of thermal equator is normally at 5°

95. Sequence towards sea to coast is

Longshore bar >low tide Terrence >berm> long shore trough .

96. **Ascending order in size** :

Arctic> Indian >Atlantic >Pasific .

97. **Relief of the ocean basin**:

*Indian ocean – sunda trench, java trencgh .

*Pasific ocean – trench: philipine , tonga ,peru chilli ,mariana (world deepest trench, 11033mt),

Island : Melanesia (figi ,newgini,), Micronesia (mariana), Polinesia (society cook).

*Atlantic ocean('S' shaped) – trench: romance , puertorico(depest),

Bottom –north atlantic bottom(dolphin ,puertorico, telegraph island), south atlantic bottom(challenger rise).

98. Large scale and topography features on the ocean floor – ridge & trench .

99. **Continental Rise** :- wedges of sediment deposited at the basis of continental slope.

100. Diago Garsia is an island is shown Indian ocean .

101. Machu pichu of civilization is located in peru.

102. **coral reef**:- accumulation and skleton of coral .

*condition for coral origin- salinity(27%0 - 30%0), latitude(20°N-20°S), temp.(20°C-30°C)

*classification- 1) fringing reef developed continent margin(lagoon)

2) barrier reef developed some distance from coast(Great barrier reef)

3) attol is aring of narrow growing coral at island formation(antillies sea, red sea, china sea, australia sea).

103. Coral reef are mostly found in Maldeep & Lakshadeep.

104. **Theory related to origin of coral reef**:

1) *Subsidence* – Darwin, Dana, Davis
2) *Antecedent platform*- Hoffmeister & Ladd
3) *Glacial control* – Dally ,
4) *Glacial control* – Murrey

105. Terrigenious deposits(gravels , sand, silt , clay mud) are mostly available

* *Blue mud*- FeSo4, CaCo3 (35%), organic(Arctic-4 million , Psific-3 million, Atlantic- 2million, Indian-1/2 million/ sq mile)

**Red mud*- FeSo4, CaCo3(6-61%), organic(Yellow sea, Coast of Brazil)

* *Green mud*- Gluconite(7.8%), CaCo3(0.56%).

106. **Neritic deposits** (West indies , Bahamus , Caribbean seas):-

1)mollusion skulls,

2)Siliceous mineral rimnents,

3) Calcarious plant rimnents,

4)Silicious plant rimnents.

107. **Pelagic deposits:-** *Oozes:*

1) Calcarious- i) Pteropod ooze –Caco3(80%), height-800-1000fathom

ii) Globigerina ooze- 3000-4000 fathom

2) Silicious – i) Radiolarian ooze- 2000-5000fathom

ii) Diotom ooze -600-2000fathom

108. The vertical movement of cold water from deeper oceanic layer to replace warmer surface water called upwelling. Its a anticyclonic circulation blows.

109. **Photic or Euphotic Zone** :- depth 200m receive solar radiation .

*Aphotic zone – does not receive solar ray.

110. **Oceanic cuurent :-** origin of ocean current is related wind , salinity , gravitational force, density.

111. **Benthos :-** the animals and plants live on seafloor on the sediments plants in photic zone and animals at all depth. It's mean depths of the sea .

Nekton:- are aquatic animals move on their own by (swimming) through water they feed on plankton. Most of the Nekton are fishes.

112. **T-S diagram** :- Water mass often show a variation of temperature and salinity with depth and are charecterised by aperticular curve on the T-S Diagram .

113. **Guyot**:- A flat topped table mount of sea is called guyot.

114. *Holocline* (salinity gradients), *Thermocline* (Temp. gradint) refers to rapid change in density with depth(300-1000mt). seasonal thermocline 40-100mt and diurnal thermocline 10-15mt.

*policline – where water density increases rapidly with depth(300-1000mt).

115. **Temparature**: - *average temp. of ocean water 17C

*latitude wise- equator (26C), 20 lat(23C), 40 lat(14 C), 60lat(1C).

(Diurnal range of temp. change 5Fathom/30feet)

(Annual range of temp. change 100Fathom/600ft)

116. **Salinity :-** Dissolved materials in sample sea water having 35‰.(NaCl – 77.8%, MgCl2- 10.9%).

* *Latitude wise*- equator – 35‰, 20°-40°N- 36‰, 40°-60°N/S- 31‰-33‰.

**Sea basis* – red sea(34-41‰), Persian gulf(37-38‰), medinterenian sea(37-39‰), Caribbian sea(35-36‰), gulf of California (25-35‰).

117.

Ocean	Average salinity(‰)
Indian	35
Meditarinean	39
Red	37-41
Dead	239
Black	17
Salt lake	220
Van lake	330

118. **Fetch:-** The distance over water where the wind blows in a single direction.

119. **Apogean tide and perigean tide**- The nearest position of the moon the earth called perigee. Tidal force powerfull when the moon are fartherst from earth these position called apogee.

120. **Neap tide and spring tide : -** When the sun , the earth the moon from right angle on 7^{th} or 8^{th} day of every forth night of a month the tide producing forces sun and moon in apposite direction.

High and low tides occur near new and full moon.

121. **Syzygy**- Sun,moon ,earth in straight line.

Conjunction- sun, moon are in one side of earth.

Opposition- earth is come between sun and moon.

Quadrature- sun, moon,earth in position right angle.

122. **Theory of origin of tide:-** a*) Equlibrium theory*>Issac Newton(1687)

b)*dynamic theory*>Laplace(1755)

c)*Progressive wave theory*>W.Whewell(1833)

d)*Conal theory*>G.B.Airy(1842)

e)*Stationary wave theory*>R.A Harris.

123. The average difference in the water level between high tide and low tide at a place *tidal range*.

124. The cold current flowing a long the coast of chile peru is known –*Humboldt.*

125. The temperature of surface water of oceans is 26.7c.

126. **Ocean trench and depth**:

*Tonga trench-7760mt

*Kuril Kamchatka-10500mt

*philippine-10540mt

*Romanche-10880mt.

127. Average range of world wide variations in sea water salinity is 34%-37%.

128. **Deepest place ocean**: pacific(Mindano deep), Atlantic(Milwaukee deep), Indian(Planet deep).

129. Due to global warming the sea level rise about 10-15cm/100year.

130. The present sea level would rise by about 60-75m ,if the ice in Antertica melten.

131. **Phisical geographers are**- *Aristotle(384-322BC), plato*
Mathematical geographers are – *Ptolemy , anaximender , Hipperchus, Thales.*
132. **The greek scholars are** – *Homer, Thales, Anaximander, Aristotle, Herodotus, Eratosthenes.*
*__Roman geographers are__ - *Strabo, Ptolemy, Solinus.*
133. ***Homer:***- In the greeks he also recognized four major winds of different properties and direction . These winds were called –Bores(north wind), Eures (east wind), Notus(south wind), Zephyrus (west wind). His works were published Illiod and Odyssey(1280-1180BC).
134. ***Anaximender***:- He introduced into the greek word of a Babilonian instrument known as 'Gnomon'. This instrument was used for measuring the varying position of the sun. He first prepare world map in scale(2700BC) .
135. ***Herodotus(485-425BC):-*** Herodotus is widely known as the father of history "All history must be treated geographically and all geography must be treated historically". He was the first to have noted about the large river of Nile – "Egypt is the gift of Nile".
136. ***Aristotle (384-322BC):-*** He mentioned about tides in his book- '*meteorlogica'*. But the cause of tidal waves he attributed to the winds .
137. ***Hecateous :-*** He was first writer of prose in a classical greek literature . He also known as 'Father of geography ' and his book was 'Gesperiods'.
138. ***Eratosthenes (276-194 BC):-*** He first used the word 'Geography'. He was famous for the correct ***measurement*** of the length of equator . He also calculated the latitude and longitude of many places ,on map using a grid system .
139. ***Hipparchus(150BC):-*** He was the first to devide the great circle into 360° .He discovered the precession of the equinox. For determination of latitude and longitude ,he invented instrument called 'Astrolabe' orthographic and stereographic projection designed by Hipparchus. He was the 'founder of Trigonometry'.
140. ***Strabo(64BC-AD20)***:- The geographical book *'Geographica'(17th volume) and 'Periplus of the erithrian sea'* to his most important work .He was the first declare geography as a chorological science. He is also considered as the Father of Regional Geography.Strabo considered earth as an *'Oblong'.*
141. ***Ptolemy(AD90-168):-*** HE was a great astronomer . His best known works are- "*the Almagast', (Syntaxis), 'The guide to geography' , 'the outline of geography'.*
*The basic objective of Ptolemy books was to reform the map of the world .
*Ptolemy first plot Bay of Bengal and he believed "*star were fixed point in a rotating sphere".*
142. ***Posidonius(135-51BC):-*** He was first ever measured the circumference of the earth. He wrote a book the. *'Ocean'*
* The book 'Historica naturalis' written by Pliny.

143. **Book and author**:

Books	Author
Human geography	Vidal de la Blache
American History conditions	E.C.Semple
Civilization and climate	E. Huntington
Geography: A modern synthesis	Peter Hagget
Explanation in Geography	David Hervey
A geographic introduction to history	Griffith Taylor
The outline of geography	Ptolemy

144. ***Varenius(1622-1650):-*** He published book *'Geographia generalis'(*1650). He was the first geographer to suggest the essential difference between physical and human geography. He believe Heliocentric univerce .

145. ***Immanul Kant(1724-1804):-*** He was not only a great philosopher he was an geologist ,astronomies and theologist . He used the term *'chorographic'* meaning descriptive to describe geography. His book 'Critique of pure reason' and his famous work '*Ankundinggung'(1757).*

146. ***Humboldt (1790-1859) and carl ritter (1779-1859):-*** Humboldt and ritter both are a modern and classical german geographer. Humboldt also believe inductive views and his book '*cosmos*' published(1845).

* Karl ritter also believe Teleological views , ritter's monumental work is entitled as 'Erdkunde'(1817 to 1859).

*Both two geographer death in 1859 and in this year 'origion of specis' published by Darwin.

147. ***German school of geographers are***:- Kant(1724-1804),Humboldt(1769-1859), Ritter(1779-1859), Ratzel(1844-1904), Richtofen(1833-1905), Oscar Peschel(1826-1875).

148. **Ratzel** :- was an determinist ,and influenced by Darwins theory. His book Political geography compared 'State' to an '*Organism'('Lebensraum'* means living space). He also coined the term 'anthropogeography'. His books are * *'travels of a naturalist' , 'Social Darwinism', 'Volkerkune'.*

His important words "I travelled, I sketched , I described".

149. ***According to Bernett,*** "*Who gets what, where, and what cost*".

150. ***Alfred Hetner (1859-1941):-*** His books are **'Travels in the Columbian andis'(1888), *European Russia'(1907), *'Suface features of the land ', *'The climates of the earth' *'Landschafts kunde'(landscape science).*

151. ***Determinism***(Nature is an active agent):- First deterministic geographer was Hipocratus. *Suporters* – Aristotle, Strabo, Al Masudi, Al Biruni, Ibn Khaldun, Ritter, Fridrich Loplay , Homboldt, E. Demolan, Ellen C. Sample, Hungtinton, Albert P. Bringhum,J. Makinder.

*Stop and go determinism – Grifith Taylor

* Neo determinism- anuchin ,Taylor

*climatic Determinism- E. Huntinton

*social/cultural determinism- Preston James, E.Ulman

152. ***Posibilism***(man is an active agent):- *Suppoters are* – Plato, Montesquie, Buffon , Kant, Alfred Kristof , Marsh, Vidal-de-la Blache(Father of posibilism/cryto posibilism), Jean Brunhes, Luciam Ferebre, Carl–o-souer.

153. ***Probabilism***- term first used O.H.K.Spate. According to Lucian Febre –"*There is no nesesities but every where possibilities". Book- 'A geographical introduction to history'(1924).*

154. ***(Ellen Churchill semple (1863-1932):-*** She was an environmental determinist.Her books are- 'Influence of geographic environment'(1911), 'American history conditions'(1903), 'The geography of medinterranean rigion'(1931), .

*she said – 1) "*Man is a product of the earths surface ". 2) "The earth is an insaperable whole".*

155. ***Mark Jefferson(1863-1949):-*** His books – *'Law of primate city' and 'the civilisation rails'.*

156. ***Carl o souer (1889-1949):-*** was first introduced the term '*landscape'*. His books – *'The morphology of lanscape'(1925) and 'A science that finds its entire field in landscape'.*

157. ***Vidal-de la-Blache(1845-1318):-*** is the founder of *'Human geography'* and he coined the concept *'Genre de vie'(life style), and 'principle of terrestrial whole', 'Pay'(short region) and 'Passage'(large region).*

* He said 1) "*Neture is never more than an advisor".*

2) "Geography is the science of place , not man".

158. ***H.J.Mackinder (1861-1947):-*** is an founder of British geography. His books - *'Brritain and british sea'(1902).* He proposed the theory *'Heartland'* with books- 1) *'Geographical pivot of history'(1904), 2) 'The democrwatic idals ans reality'(1919), 3) 'Round world island and wining the peace'(1943).*

* He said "Who rule east Europe commands, the heartland ,

……

……

who rules the world island, commands world".

159. ***Petric Geddes(1854-1934):-*** He gave the concept *'conurbatoin'*. His important work *,evolution'(1915), and 'old town'*.

* his surveying place-folk-work-

Place	Place work	Place folk
1) Work place(pasture, workshop) 2) Folk place(village, home)	1)work 2)folk(occupation)	work folk industrial folk

160. ***Peter Hegget(1933):-***was an supporter of Human geography ad his books are – *'Modern in geography' , 'Geography :A modern synthesis', 'Locational analysis in human geography'.*

161. ***Devid hervey's books are*** – *'Social justice and city'(1973) and 'Explanation in geography'.*

162. ***Davis(1850-1949):-*** His concept of geographical cycle describe landform evolution. His important concept was *'Ontography'*.

163. ***Isaiah Bowman:-*** He published the *'Pioneer fringe'* in 1931. He said "*Man is changing himself as well as the world as he goes along".*

* His book are *'Forest physiography'(1911), 'The new world problem in political geography'(1921).*

164. ***Rechart Hertshorne:-*** *supporter of regional geography .

*books- 1) 'The nature of geography'(1939),

2) 'Perspective on the nature of geography'(1951).

* he was coined the term 'Arial differntation'.

165. ***positivism:-*** is also called *emphiricism* .

-*supports - Comte(1976), Gregory(1978), Johnston, Youer, Skiffer.

**Logical positivism(1920-1930)* - L. Wittgenotein, R.Carnap, A.J.Ayer.

166. ***Radical geography(1960-1970):-*** This geography developed as areaction to the quantitative revolution. It published on antipode journal(1969).

**supporter*- Peet(1977), David Hervey , William Bunge.

167. ***Humanism(1970's decade):*** used for first time in 1976. This geography developed criticism against positivism and quantitative revolution.

**supporters*- Yi-Fu-Tuan(1976), J. Wright(1947), Kropitkin, Recclus, Anne Butimer(1978).

168. ***Behaviouralism(1960's):-*** to develop humanity and spatial locational theories develop through quantitative revolution .

**supporters*- Kates(propounder of this geography,1962), Kirk, Kant , Carl-o-souer, Julian Olpert(1933), Cox , Golge, Gould(1965).

169. ***mental map***- Environment = Image= Behaviour

*supporters- Gilbert White(1965), Peter Gould(1965), Lynch.

170. ***Systmatic geography*** – Humboldt(father), Skiffer, Ackerman.

*Regional geography – Carl Ritter(father), R.Hartshorne, Carl-o-sauer, Vidal da la blache.

*supporters- D.M.Smith , P.L.Knox , David Hervey.

*"Who,what get where,how?" – D.M.Smith(1973).

171. ***Arab geographers*** : - *Ibn Haqul(943-973AD)- *'A book of routs and realms'*

*Al masudi (985AD)-16 climatic regions. '*Conception of the spericity of the earth'*.

* Al Idrishe(1099-1180AD)- "*Amusment for him who desire to travel around the world'*.

Ibn Batuta(1304-1368AD)-'Rihlah'*

* Ibn khaldun(1342-1405AD)-Founder and father of modern historiography. His books *'Muquaddimah'*.

Al Balakhi(921AD)-'Kitab ul ashkal'*

*Al biruni (1030AD)- *'Kitab ul hind'*

*Ibn sina, *Al maqdisi- 14climatic regions.

172. **Time geography**:- The founder of time geography was T. Haggerstrand(1970). He said , "Time has to be taken into account along with space".

*supporters – Allan Pred (1936-2007).

His concept 'place, practice and structure'(1986).

173. **Post- Modernism**:- The concept 'postmodernism' first introduced by Arnold .J. Toynbee(1934).

174. **Phenomenology**:- Its meaning is Appear. E.G.A. Husserl first established philosophical school of phenomenology.

*supporters- E.Relph(1970), Yi-fu- Tuan(1971), David C. Mercer and J.M. Powell(1972), A. Buttimer.

175. **Feminism**:- First introduced (1970's)middle.

*supporter Betty Fridem(1921-2006) .

*supporter of Ecofeminism is – F. Eaubonne.

176. **Structuralism(France):-** supporter- Clad-levi-staus(Father), C. Levi Stauss, Jean Piaget, Devid Hervey, Derek Gregry.

177. **Paradigm shift**:- paradigm shift concept first introduced by Thomas kuhm(1962). Scheafer who brought about change of paradigm .

178. **Greek Geographers chronology**:
Homer>Thales >Anaximander >Hecateous >Herodotus>Plato>Aristotle>Alexander> Hipocratus>Pythius>Polibious>Hiperchus>Posidnious.
Roman geographers: - Strabo>Ptolemy

179. **Arab geographers**:- Al Battani>Al masudi>Al Biruni>Ibn sina> Al ldrisi > Ibn batuta>Ibn khaldun.

180. **German geographers**:- Varrenious>Kant >Humboldt>Rihes>Pechel>Richtopher> Ratzel> Penck> Wegner> Hetner> Sluter> troli.

181. **British geographers**:- Spencer> Gedder> Malkinder> Herbertson> G.Taylor> Stamp> Spate> D.Hervey.

171. Crop Combination:- provided a good basic for agricultural regionalisation.

- *J.C. Weaver* (1954) was the first who used such technique in Middle West U.S.A.

172. Techniques of Crop Combination:-

- *Weaver* method- A.D.= $\sqrt{(\Sigma d^2/n)}$
- *Coppock* used animal husbandry combination.
- *K. Doi* used computerized minimum Σd^2 of crop combination
- *Rafiullah* (1956) method- $d=\sqrt{(\Sigma D^2p-\Sigma D^2n/N^2)}$.

173. Crop Diversification:- It is opposite to Crop Specialisation. Degree of Diversification –

i) *rich farmer* – Specific
ii) *Subsistence farmer*- diversified

174. Techniques of Crop Diversification:-

- *Gibbs & Martins* method = $1-[\Sigma x^2/(\Sigma x^2)]$
- *Bhatia* Technique-Index of crop combination=sum% of cropped area under x crop/no. of x crop
- *J. Singh's* technique-= sum % of harassment area of (N) crop/no. of N crop.

175. Crop concentration:- means the variations in the density of any crop in an region at a given point of time .

176. Cropping Intensity:- formula= $(\Sigma aij/aio)/(Ni/No)\times100$
[Where , $\Sigma aij/\Sigma aio$ =Net crop area, Ni/No= Net shown area.]

177. Agricultural Efficiency:- Farm efficiency profitability refers to the surplus of value of output overall cost.

178. Following techniques of agricultural productivity are –

- To asses agricultural production as grain equivalents*(Buck,1967)*

- Input-Output ratio*(Khusro,1964)*
- Ranking co-efficient method *(Kendall,1939; Stamp,1960; Shafi,1990)*
- Carrying capacity of land in term of population *(Stamp,1958)*
- Determining an index of productivity*(Enyendi,1964; Shafi,1972)*
- Computing the crop yield and concentration indices ranking co-efficient *(J. Singh,1976)*
- Giving weight to the ranking order of the output per unit area with the % share under each crop *(Sapre and Deshpande,1964; Bhsatia,1967)*

179. World agricultural regions :- classification of world agriculture was that proposed by *D.Whittlessy in 1936*.

1) Nomadic herding(Mongolia) , 2) Livestock ranching , 3) Shifting cultivation, 4) Rudimental sedentary tillage , 5) Intensive Subsistence tillage, rice dominant, 6) Intensive subsistence tillage , without paddy rice , 7) Commercial plantation crop tillage (Sri Lanka), 8) Mediterranean agriculture , 9) Commercial grain farming (Argentina), 10) Commercial livestock and crop farming, 11) Subsistence crop and livestock farming, 12) Commercial dairy farming(New Zealand), 13) Specialised horticulture.

180. Von Thunen Model:- A normative economic model of agricultural location was first presented by *V. Thunen in 1826* in his book 'Der isolierate Stat'.

- *Model-1: Zone-1:* Market , *Zone-2*: Dairy and vegetable , *Zone-3*: Production of firewood , *Zone-4*: Production of agricultural crops, *Zone-5*: Grazing animal.
- *Model-2:* Central city, Market gardening and milk production , Firewood and lumbering production, Crop farming and fellow & posture , Three field system, Livestock farming.

181. Economic Rent:- Locational Rent, LR=Y(m-c)-Ytd

[Where, Y= production in land , m=market price, c=production cost , t=transport cost, d=distance from market agricultural land.]

182. Determination of Profit:

P=V-(E+T)

[Where, P=profit, V=selling cost of agricultural crops(Value), E=production expenses.]

183. Shifting cultivation in Different countries:

Shifting cultivation	Countries
Jhum	India/Bangladesh
Chena	Sri Lanka
ladang	Malaysia
Huma/Luma	Indonesia
Tonga	Myanmar
Tamrai	Thailand
Roka	Brazil
Konuke	Venezuela
Milpa	Mexico
Masole	Congo

184. Synonyms of shifting cultivation in India:-

Shifting cultivation	Region
Jhum	North East India
Kumari	Western Ghats
Watra	South East Rajasthan
Podu	Andhra Pradesh, Odisha
Ponam	Kerala

185. *A. Weber* in 1909 'Uber Den Standort Der Industrien' book , he proposed his 'Least cost Theory' of industrial location.

186. Material Index:- M.I.=Weight of the localised material used in the industry/Weight of the product.

M.I.	Raw Material	Ex.
1	Pure	Cotton
>1	Impure/weight loosing	Iron ore
<1	Extra pure	Ice cream

187. Locational theory of Indutry:-

Theory	Founder	Year
1. ***Least cost theory***	Alfred Weber	1909
2. ***Relative location theory***	Richard Hartshorne	1927
3. ***Central place theory***	Walter Christaller	1933
4. ***Profit Maximization theory***	August Losch	1940
5. ***Location principle of Building Industry***	J. Rener	1947
6. ***Location of economic activity***	Edger Hoover	1937
7. ***Industrial location through profit motive***	Harold Hoteling	1929

188. When Both 'R1' and 'R2' are Fixed and Gross , *A. Weber* introduce his concept of **'Locational Triangle'**.

189. * Isotim= Equal transport Cost line(raw material or produced material)
***Isodapane**=Equal total transport cost line (raw material+ produced material)

190. Index of Labour cost:- is the average cost of labour needed to produce one unit weight of output.

191. Labour co-efficient :- is the ratio of labour cost per unit of product weight to the total weight of material and product to be moved.

192. ***Tord Palander(1935)*** **in his theory of industrial location** given the place of production , the competitive conditions , factory costs and transportation rates, how does price effect the extent of the area.

193. According to *Alan Pred,* the location of an industry is associated with **Behavioural Approach**.

194. According to *Harold Hotelling,* to explain the industrial location through the **profit Motive in 1939.** In his theory the impact of demand was considered together with the idea of the locational interdependence, where by firms in perfect competition arrange themselves spatially for mutual sells benefits.

195. ***Edgar Hoover*** **the location of Economic Activity** in 1937 profit maximizing theory of *August Losch* explain the size and shape of market area which a location would command the largest revenue.

196. Transport Network Models:-

Model	year	Founder	Working place
Basic sequence of network development and settlement growth	1963	TMG(Taaffe, Morrill & Gould) Model	Ghana, Nigeria
Five stages of mercantile model	1960	Vance	Eastern America
Four phases in the evolving interrelationship between metropolitan and third world countries	1977	Rimmer	Colonies of Europe

197. Different index in transport network:-

* Alpha index(α)=actual circuits/maximum circuits

= (e-v+1)/(2v-p) [ranges 0 to 1]

- Bita index(β)=arcs/nodes [ranges o.o to 1.0]
- Gama index(γ)=e/{3(v-2)} [ranges 0 to 1]

198. Cyclomatic number =a-(n-1) [a=no. of arcs, n=no. of nodes]

*Detour index= (actual route distance/straight line distance)× 100

* *Kensky* developed two indices- Pi Index & Eta Index.

199. Accessibility:- measured in 3 ways -1) Shortest path matrix

2) By associated number

3) By Shembel Index.

200. Authors and books:-

Authors	Books
1. Keeble	Industrial location & planning in U.K.
2. Glasson	An Introduction to Regional Planning
3. Charles	Regions in Question
4. Klasson	Area Social and Economic Develolopment

201. Formal Region:- It's also called Homogeneous Region/Uniform Region.

[Ex.- Physical region, Agricultural region, Climatic region(ex.-Maruthali), Edaphic region(ex.-Deccan Trap), Zoogeographic region(Sundarbans), Forest region.]

*Method of delination -1) weighted index number method by Bowdeville.
2) The factor analysis method by Berry (USA).

202. Functional Region:- It's also known as Heterogeneous region.

Ex.- *Nodal region*(Metropolitan , Industrial, City)
Ad hoc region(River valley , transition zone)
*Method of delination – 1) Flow analysis
2) Gravitational analysis.

***203.* Planning Region**:- "It is an area displaying some coherence or unit of economic decisions". - *Boudeville.*

Ex.- Resource devoloipment region, Administrative region.

204. Type of planning region by Geographer's :-

Geographers	Types
L.S. Bhatt & Rao (1964)	7 Macro, 51 Meso
V. Nath(1965)	15 Main, 41 sub division
P. Sengupta (1968)	7 Macro, 42 Meso
C.S. Chandrasekhar & R.P. Mishra **	13 Macro, 35 Meso
S.P. Chatterjee	13 Macro

**Town and Country Planning Commission of India.

205. Non-Spatial Region:- includes in which spatial dimension is not explicit such as National Economic Planning(NCP), Family Planning, Energy planning and social planning.

* Sectoral planning is an non-spatial planning .

206. Spatial Planning:- assumes spatial incidence of the various elements , natural and manmade leads to the formation of spatial sub-system of regions.

* Spatial planning are two type-1) Adaptive planning (is based on a recognition of the impact of general trends of development on the spatial system.)

2) Developmental/Active planning (based on the pressure and requirments of natural economic development.)

207. Core-Periphery Model(stages of growth) :- Periphery and highlights that spatial inequalities change over time .

Stage-1: No urban hierarchy

Stage-2: primate city

Stage-3: Regional sub-centres

Stage-4: Regional inequalities are reduced in a fully integrated urban system.

208. Theory of Cumulative Causation and Spatial Interaction (1956) by *Gunner Myrdal*:-Following 3 stages of economic development-

1) *Pre-industrial stage*:-regional inequality at max. level

2) As growth occurs at rapid rate and its backwash effect result in regional inequality

3) *Final stage*:-the fruits of economy are growth spreads and the spatial effect of economic growth results in reducing imbalances in regional development.

209. Classification of world into 3 classes by *Johnston*.

1st world – Advanced capitalist society

2nd world- Static socialist nations

3rd world- Underdeveloped or Developing nations

*The term '3rd world' was first used by Frantz Farwn.

210. *Rostow*'s Development Model:- 5stages are-

Stage	Stage condition	Components
1st	*Transitional Society*	Subsistence, baster, agriculture.
2nd	*Transitional stage*	Specialization, Surplus, Infrastucture
3rd	*Take off*	Industrilization, growing, investment , regional growth
4th	*Drive to maturity*	Differensification, innovation, less reliance on imports, investment
5th	*High mass consumption*	Consumer oriented, durable goods, service sector becomes domint

211. Growth pole Hypothesis of *Francois Perroux (1955) and Boudeville*.

212. The concept of planning in Capitalistic Economy was a post-world war 1 development under the Marshal Plan. It's was largely under the Capitalistic Thinking .

*This approach was a Non-Classical Approach and based on *Keynesian Approach*.

213. Theory of Balanced Development given by *Nurkse & Radon Rodestein*.

* This theory supported by Albert O. Hirschman, Hans Singer, Paul Streeten, Marcus Pleming.

214. Multilevel planning:-

Level	period	Committee
Central Plans	1st 3 plans	NCR
District level plans	1969	• B.R. Mehta committee(1957) • Administrative reform committee(1967) • Honshu Mahta committee(1982) • Grk Rao Committee(1985)
Block level plans on Panchayati raj	1978-83	• The Dantwala Group • Ashok Mahta committee

215. Hierarchy for planning region:-

Types	Regions
Micro planning region(10)	Dandakaranya, Desert region.
Meso planning region(8)	Narmada valley, Chennai, Bengaluru, Chota Nagpur Industrial region.
Macro planning region(8)	North-East Region, Western Rajasthan and Gujrat.

216. Different models:-

Model	Founder
Gravity model	Zipf Steward
Breaking point model	Reilly

217. Axial Development Region:- Planning region develops along transportation line or irrigation channel .

* "There is only one region the surface of the earth on which mankind finds its house"- *Minshull*.

218. NITI Aayog :- National Institution for Transforming India (NITI) is a policy think tank of Govt. of India established in 2015.

* Its replaces Planning Commission.
* It has a dual objective of achieving Sustainable Development goals and to enhance co-operative Federalism with 'Bottom to Top' Approach.

219. NITi Aayog initiates includes plan time as-

Plans	Period
Action plan	3 year
Strategy Plan	7 year
Vision plan	15 year

220. ***Planned city in India*** are Chandigarh, Bhubaneswar, Jaipur.

* "Regions are good servants but bad master's"- *C.C. Carter*.

221. Scale and map Reduction and Enlargement:-

Large scale maps have smaller values of denominator in R.F. and vice versa.

*Opisometer/Rotameter (measure distance between points on a map), Planimeter (measure area on a map), Pantograph (reduction and enlargement of a map).

222. A map bearing scale 1:6000 enlarged 4 times its original size R.F. of new map.

Ans: map/Old map = Ratio (when, enlarged 4times =√4=2)

R.F. of new map = 1/6000 ×2
=1:3000.

223. Diagrammatic presentation:- 1) *1-Dimentional*(Bars, pyramid),
2) *2-Dimentional* (square, rectangular, circle)
3) *3-Dimentional* (cube, sphere)
4) *Special* (rainfall, pictorial, dispersion).

224. Small to large scale map:-

Map	World map	Topographical map	Cadastral map
Scale	1:250000	1:50000	1:4000

225. Climograph :- 1st prepared by Ball(1910). It prepared modified by Taylor (1949).

1) *Raw(SE)*-below 40F, over 70% R.H. (cold and too wet)

2) *Muggy(NE)*-over 60F , over 70% R.H. (warm and wet)

3) *Scorching(NW)*- over 60F , below 40% R.H.(very warm and dry)

4) *Keen(SW)*-below 40F, below 40% R.H.(cold and dry).

226. Dot map:- also indicate in rural population. It uses single dot for single unit of population.

227. Band Chart:- The component part chart also called band chart in line diagram.

228. Biaxial graph:- are drawn a reference frame of mutually orthogonal axes , they are generally known line graph .

229. Sphere diagram:- showing urban population.

Formula- 4/3 Πr3

230. Pie diagram:- also known as a sector or circle diagram. It also uses in land use in % of various corp.

231. Choropleth map:- Dasymetric map impose version of it. It shows the homogeneity and population density (quantitative method).

232. Chorochromatic map:- areal distribution of line, symbols, colour patterns. Ex. – land use map.
* It is qualitative map and also called colour patch map.

233. Parallel with 1° interval can be drawn between the poles on a globe 179. Meridian with 1 interval can be drawn on the globe 360.

234. Isoline method used interpolation :-

Isohaline (rainfall), Isotherm (temperature), Isonif (snowfall), Isohel (sunshine), Isoneph (pressure).

235. Hature line :- disconnected line used for showing slope on map.

236. Type of projection:-

Type	Projection
Perspective	Gnomonic, Stereographic, Orthographic, Simple conical with one standard parallel
Semi perspective	
Non perspective	Polar Zenithal equidistant, polar Zenithal equal area, Conical Equal area with 1 & 2 standard parallel, Orthomorphic 1 & 2 standard parallel
Conventional	Bonne
Aphyletic	Simple conical with 1 standard parallel

237. Loxodrome and Orthodrome for projection:-

Projection	Loxodrome	Orthodrome
Mercator	Short	Curve
Gnomonic	curve	short

238. Heterogeneous population represent *Stratified sampling*.

*When population are homogeneous indicates Simple random sample.

239. Histogram:- showing frequency distribution of Raw Data.

* Ogive showing on Median With means cumulative frequency curve more or less than type.

240. ***Mean*** is less affected by sampling fluctuation.

Dispersion is not calculated for Geometric mean.

241. In ***Median*** Variable which divides the group of two equal part and statistical measure is not affected by extremely large or small value.

242. Standard deviation:- It's called root mean square and used to measured for Dispersion.

243. A ***frequency polygon*** looks like a frequency curve when the class width infinitesimal small.

244. Skewness:- Mean=Median=Mode (Normal Distribution)

Mean>Median>Mode (Positively skewed distribution)

Mode>Median>Mean (Negatively skewed distribution)

* According to Karl Pearson Skewness =3(mean-median) / standard deviation.

245. Co-efficient of variation:- compare between two variable

C.V. = sanderd deviation/mean ×100

246. Kurtosis:- 1) *Mesokurtic(k=3)*- bell shaped,

2) *Platykurtic(k=<3)*- Flatter shaped

3) *Leptokurtic(k=>3)*- More peaked shaped

247. Product movement co-relation co efficient:- Pearson method measure of linear co – relation.

Co-relation	Value
Strong negative	-(0.9-1)
Moderate negative	-(0.5-0.8)
Negative	-(0.1-0.4)
Positive	+(0.1-0.4)
Moderate positive	+(0.5-0.8)
Strongly positive	+(0.9-10)

248. Rank Co-relation known as Spearman method-

R = 1-(6 €d2/N3-N).

249. ***Nearest Neighbourhood Analysis*** introduced by *P. Hertz*. Also used by Clark and Evans. It's analysis for settlement distribution pattern.

Rn = Do/De (where, Do=mean distance, De = mean expected distance).

250. Rn value and settlement pattern:-

Settlement pattern	Rn value
Perfect uniform	2.14
Tending to random	1.20
Highly uniform	1.81
Perfect clustering	0.00
Tending to clustering	0.6
Highly dispersed	2.15

251. Type Topographical map:- This map was prepared by SOI(survey of India) ,1767.

* It's headquarter is Dehradun.

Sheet	Scale	Lat. And Long.	Map no.
Million	1:1000000	44	73
Quarter inch/Degree	1:250000	11	73C
½ Degree/ ½ inch	1:100000	3030	73C/NW
Quardrant/inch	1:50000	1515	73C/12
Special	1:25000	7 ½ 7 ½	73C/12/NW

252. ***Rating Curve*** showing channel or water discharge of river.

253. Lorenz curve (cumulative % curve):- tending to line of equal distribution .

* Gini- co efficient measure inequality of distribution.

254. 'X' axis of diagram horizontally and independent variable. 'Y' axis of diagram represent vertically and dependent variable.

255. ***Scatter diagram*** show regression line and eye estimation line.

256. ***Positive Vernier scale*** = (main scale 9, vernier scale 10) 9=10

Negetive vernier scale = (main scale 10, vernier scale 9) 10=9.

257. Fisher 'Z' test – ratio of two independent estimation population.

Formula, $X^2=\Sigma(O-E)^2/E$

Che-square test('T' test)- compare two random sampling .

Formula, $X^2=(O-E)^2/E$ (where, O= observed, X^2= che-square).

258. Co- efficient quartile deviation = (Q3-Q1)/(Q3+Q1) showing rainfall dispersion diagram.

259. ***Spatial data*** is stored in computer by using digitiser and scanner.

260. ***Index overlay method*** based suited ground water exploration by using GIS tools.

261. ***Raster data*** start from upper left corner of the displayed window.

262. Areal photography (3D stereoscope):-

Flying height = Focal length× Scale of photography

*A pair of two overlapping areal photographs arranged stereovision called stereogram.

263. Different satellite:-

Satellite	Orbit	Height	Ex.
Geostationary	Equatorial	36000mt	INSAT (India), GOES (USA).
Sun-synchronous	Polar	600-1000mt	LANDSAT (USA, 1967), IRS (India,1988), SPOT (France,1986).

*Geo-synchronous satellite –METEOSAT (Europe)

264. Wave length:-

Wavelength	Component
0.45-0.52	Useful coastal water, soil, vegetation maximum penetration of water
0.52-0.60	Green reflectance peak vegetation plant
0.63-0.69	Chlorophyll of absorption band useful plant
0.76-0.90	Reflect IR width MSS band use full biomass survey and water body delineation.

265. Band with wavelength:-

Ray	Wavelength
Visible	0.4-0.7μm
Near infrared	0.7-3.0μm
Microwave	0.1-1.0m
Thermal infrared	8-12m
Photographic	0.3-0.9μm
Optical	0.3-15.0μm
Reflective	0.7-3.0m
Infrared	3.0-15.0m

266. Parameter and value:-

Nanometer	10^{-9}
Micrometer	10^{-6}
Milimeter	10^{-3}
Meter	10

267. ***Rank size rule*** explain the relationship between population of cities and rank of cities.

* This relation shown by G.K. Zift (1941).

268. F.C.C. on different landscape:-

Different landscape	Ideal F.C.C.
Vegetation/grass	Red shadow
Deep forest	Deep red
Shallow forest	Abraded red
Green rice land	Reddish
Yellow rice land	Blackish red
Marsh land	Deep sky blue
Fellow land/red land	Green
Deep ocean	Black

Ocean	Deep blue
Settlement	Greenish blue

269. Different platform:-

Platform	Ex.
Space borne	Rocket , artificial satellite
Ground base	Tripod , Remote sensing van
Air base	Air craft baloon

270. Resolution:- power of discrimination. Resolution 4 types:

Resolution	Description	Ex.
Spectral	Related E.M.R.	M.S.S.(0.6-0.7μm),T.M.(0.63-0.69μm)
Spatial	Dependent on I.F.O.V. and height of satellite	I.R.S. 1A/1B Liss I- 72.5m Liss II-36.25m Liss III-23.5m Liss IV-5.8m
Radiometric	Depend on grey value range	LANDSAT 1,2,3- 6 Bit(2^8) SPOT- 8 Bit(2^8)
Temporal	The no. of days taken by the sensor to come back on its original path	LANDSAT 1 – 18 days

271. Type of Dispersion:-

* *Absolute* (Range, Quartile Deviation, Mean Deviation, Variance, Standard Deviation)

**Relative* (Co-efficient of variation, Z-score)

272. Hypsometric Curve:- describe the area height relationship of a drainage basin dimensionally.

273. The term 'Ecosystem' propounded by *A.G. Tansley*. It is Open System.

- The term 'Biosphere' first used by *Edward Suess*.
- The term 'Ecology' first used by *Ernest Heckel*.

274. Biotic component of ecosystem:-

i) *Producer/Autotrophs* (phytoplankton)

ii) *Heterotrophs/consumers* -*Herbivores (eat living plants),
*Carnivores (eat animals),
*Omnivores (eat plant & animals)
* Detritus (eat producer & consumers)

275. ***Shanon Diversity index (H)*** was charecterised species diversity in a community.

276. The term '***Ecological niche'*** first used by *Roswell Johnson*. But *Joseph Grinnel* was first described Niche of a variety of species in 1917.

277. ***Gaya Hypothesis*** was first formulated by *James Lovelock*.

* It was known as Ecological Hypothesis.

278. Concept of Biodiversity:- The term 'Biodiversity' first used by *Walter G. Rosen (1986) on 'National Forum on Biodiversity'*. But *E. O. Wilson* was called as *'Father of Biodiversity'*.

* Biodiversity rich country in world has 12 Nations.

279. Types of Biodiversity:-

Order of biodiversity	Description	Ex.
Genetic	Genetic difference in a species	Man have 35000-36000 species
Species	Total no. of different species in area	16 lakh species in world
Ecological/Community	Total no. of biotic and abiotic component in ecosystem. Its 3 types are- *α *diversity*- diversity of biotic community in a ecosystem *β *diversity*- diversity of biotic community of different habitat in a geographical area *γ *diversity*- total diversity of different community species	

280. The term '***Biodiversity Hotspsot'*** was first used by *Norman Meyers in his book 'the Environmentalist'(1988)*. It's identified 34 in the world.

*4 biodiversity hotspot in India are- i) western Ghat, ii) Himalaya iii) Indo- Burma, iv) Sundaland.

281. Databook of IUCN for Endangerd species:-

Book	Species type	Ex.
Green data	rare species	Himalayan salamander, ghariyal
Red data	Endangered species	Royal Bengal tiger
Black data	Extinct species	Dodo bird in Morisus

282. Mono-climax theory proposed by Fredrich Climents & Poly- climax theory proposed by Braun Blanquet and Tansley.

283. The concept of '***Ecological pyramid'*** was first given by *Charles Elton*. (1939)

It's are 3 type – i) food pyramid, ii)biomass pyramid , iii) energy pyramid.

284. Biome:- All the ecosystem taken together in a geographical area in a bigger unit basis of vegetation and climate.

285. Domestification of plants and animals was started *Niolithic period*.

286. *"There is no holyday for vegetation growth is rapid uninterrupted and continuous".*- The statement applies for rainy tropics.

287. Sequence order from equtor to poles- Selva>savannah> taiga>tundra.

288. Climax pattern Hypothesis was propounded by *R.L.Whittaker*.

289. '*In-situ'* means 'at the site' and it is the fundamental and principle method. Because it prescribed the protection of biodiversity where naturally occur.

Ex.-Sanctuary, National park, Reserve Forest, Protected Forest.

290. '***Ex-situ'*** means 'Off the site' or 'away from the site' and it involves the preservation of sample populations of various species or their genes in scientific facilities.

Ex.- Zoo, Botanical garden, Seed banks, Sperm banks, Gene banks etc.

291. National park:- is a relatively large area of one or several ecosystem that are not being materials altered by human exploitation and occupation.

Description of National park	Name of National park	Location
First (of World)	Yellowstone park(1872)	USA
First(of India)	Jim Corbett Park(Hailey), 1936	Uttarakhand
Largest /Highest(of India)	Hemis	Ladakh & J. and K.
Largest (of World)	N. E. Greenland	N. pole
Shortest (of India)	South Button Island	Andaman & Nicober Island

292. Sanctuary:- State govt. may, by notification , declare any area other than an area comprised with any reserve forest or the territorial waters.

*Generally species oriented as Great Indian Bustard (Rajasthan).

293. Biosphere project for Endangered species:-

Project	Famous for
Rhinoceros	Great one-horned (Assam)
Gharial	Unique species of Crocodile
Vulture/ Raja Bhat Khaya	Critically endangered species
Snow leopard	Himalayas in N. India
Hangul/Kashmiri stag	Dachigram(Srinagar)
Red panda(Cat bear)	Arunachal Pradesh , Sikkim and Himalayas around Darjeeling

294. Biosphere Reserve:- The idea of the Biosphere Reserve was initiated by UNESCO in 1974 under the Man and Biosphere Programme (MAB).

* The Biosphere Reserve Programme was initiated in India in 1986 (18 sites till today)

295. Sacred Grooves:- comprises of patches of forest from few trees to vest expose of a forest which are usually dedicated to a local god or deity.

Ex.- i) Gumpa forest in Arunachal Pradesh,

iii) Khecheopalri lake in Sikkim.

296. Biosphere Reserve in India:-

Year	Name of Biosphere Reserve	Location	State	Key fauna
1986	*Nilgiri*	Parts of Waynad	T.N. , Kerala, Karnataka	Nilgiri tahr, Lion tailed macaque
1988	*Nokrek*	West Garo Hills	Meghalaya	Red Panda
1989	*Gulf of Mannar*	Rameswaram island in North to Kanyakumari in south	T.N.	Dugong
1994	*Silmipal*	Part of Mayurbhanj District	Odisha	Gour, Royal Bengal Tiger, Asian Elephant
2005	*Achanakmar-Amarkantak*	Part of Anupur, Dindori and Bilaspur District.	M.P. & Chhattisgarh	Indian Wild Dog, Vulture, Sarus crane
2009	*Cold Derest*	Pin valley Natonal Park , Chandratal and Sarchu & Kibber Wildlife Sanctuary	Himachal Pradesh	Snow leopard
2001	*Agasthyamalai*	Neyyar, Peppera & Sheduruny Wild life Sanctuary	Kerala, Tamil Nadu	Nilgiri Tahr, Elephents
2010	*Seshachalam HIlls*	Chittor and Kadapa districts	Andhra Pradesh	Slendr loris
1997	*Dibru - Saikhowa*	Part of Dibrugarh and Tinsukia districts	Assam	Golden Langur

297. Efforts for conservation:-

Projects	Description
Haathi Meere Saathi	Was a campagn Launched by MOEFCC
Vulture	Population has under a threat due to medicine 'Diclofenac'
Snow leopard	Its found in Himalayan states (Himachal Pradesh) at altitude >3000m.
Turtle	Its found in Bhitarkanka & Gohirmatha (Odisha)

298. Famous Books of Environment:-

Authors	Books
Rachel Carson	'Silent Spring'(1962)
Santa Barbara	'Oil Spill'

299. Deep and Shallow Ecology:-

Sub.	*Shallow*	*Deep*
concept	The central objective of the shallow ecologists in fighting against pollution and resource depletion.	Nature does not belong to human & humans have no right to destroy natural features of the planet.
Resource means	Resource for humans.	Resource for living being.

*The concept 'Deep Ecology' was named by Norwegian Arnest Naess(1973).

300. Ecological Footprint:- means human demand on nature , i.e. the quality of nature it take to support people . The first academic publication on ecological Footprints was published William Rees in 1992.

*It was published the book 'Our Ecological Footprint: Reducing Human Impact on The Earth' with illustration by Phil Testemale.

301. Green Muffler:- refers to the plantation of 5-6 rows , around populated areas like societies or having schemes near highway, of dense trees to reduce noise pollution.

302. Reserved Forest (R.F.):- the term was first introduced in Indian forest Act 1927. These forests are looked after by the Govt. and no public entry is allowed for the collection of Timber or Grazing of Cattle.

Protected Forest(P.F.):- These forest are also looked after by the Govt. but the local people are allowed to collect forest resource.

303. Ganga Action Plan:- was launched in the year 1986 to reduce pollution in Ganga.

*'*Namami Gange*':- It is a programme initiated by the Modi Govt. in 2014 with an estimated budget of 20000crores.

304. National Air Quality Index (NAQI):- The AQI was launched in 2014 under the Swachh Bharat Abhiyan . It is outlined as '*One number –One colour-One description'* for the common to judge the air quality cleanliness.

*The Indian Institute of Technology (IIT) , Kanpur and the expert group recommended an AQI scheme in 2014.

305. Carbon credit:- A carbon credit is a tradable certificate or permit representing the write to emit want on Co2 for equivalent amount of emission of every other greenhouse gas (By a Government agency).

306. CESS:- Cess on coal producers of India. In India there is a Cess on coal producers.

*It's levied at the rate of 400/tons. Further the CESS collected by the Govt. under the National Clean energy Fund (NCF).

307. **IPCC (Intergovernmental Panel on Climate Change):-** It was established in 1988 by United Nations Environment programme (UNEP) and World Meteorological Organisation (WMO). The IPCC published its periodical reports on climate change.

* Its headquarter – Geneva (Switzerland).

308. **Cartagena Protocol on Biosafety** :- is an International agreement on Biosafety, as a supplement to the convention on Biological Diversity effective since 2003.

309. **Nagoya Protocol**:- is a supplementary protocol on convention on Biological Diversity (CBD) to ensure fair and equitable shearing of benefits on the use of Biological resource . It provides on transparent legal framework for the effective implementation objectives of CBD.

*Place of Nagoya Protocol- Qualamlampur.

310. **Montreux Records** :- It is the register of Wetland .Sites of International importance , where undesirable change in the ecological character have occur , are occurring or are likely to occur . These Wetlands are also recognised under Ramser Convention.

* place - 1996 at Brisbane (Australia).

311. **Rotterdam Convention**:- These convention was adapted in Rotterdam (Netherland). It is an intergovernmental treaty. Signatory Nations can decide weather to allow the import of chemicals listed under the treaty or not an exporting nations are required to make sure the export within their country do not export the chemicals and completely with the other rules of treaty .

312. **Basel Convention**:- It is for the control of transboundary movement of hazards waste and their disposal and specifically to prevent transfer of hazards waste from develop to less developed countries .

* place - It was adapted in the year 1989 in Basel(Switzerland).

313. **Kigali agreement**:- Countries came to an agreement in Kigali(Rwanda) took face out a family of Portained by the late 2040's and move to prevent a potential 0.5°C rising global temperature of the end of the century.

314. Ramser Site of India:- There are 26 Ramsar site in India.

Ramser Site	Location	Year
Nal Sarobar (latest)	Gujarat	2012
Keoladeo/Bharatpur bird Sanctuary(First)	Rajasthan	1981
Chilika	Odisha	1981
East Kolkata	West Bengal	2002

* Ramsar Site conference was organised in Iran (1971).

315. Hot Spot :- is an area of ocean that needs special protection because of its its wild life and significant under water habits .

Ex. – Andaman and Nicobar Island and Lakshadweep Island are the first place in India to have been aided in the list of 50 Global Hope Spots.

316. Environmental related diseases:-

Diseases	**Source**	**Impact on man**
Minamata(Japan,1956)	Methyl Mercury bio-accumulate in fishing	Neurological diseases
Itai Itai(Japan,1912)	Cadmium poisoning	Softening of bones and kidney failure
Blue baby syndrome	5 nitrate contain	Decrease in the O2 carrying capacity of Hemoglobin
Silicosis	Silica industry	Deposition of silica in the lungs
Asbestosis	Asbestos industry	A lung diseases
Pneumoconiosis(Black lung diseases)	Coal blast in coal mines	Respiratory system of victims
Emphysema	Air pollution and smoke	Breaking down sensitive tissues of lungs

317. Kuznet's Curve in Environment:- is based on the hypothesis that as an economy develops economic inequality first increases then decreases.

* The Hypothesis was first advanced by the economist Symon Kuznet's in 1950's and 1960's.

318. **Acid shock (Acid Surge)**:- H2So4 and HNo3 acids are aided to the atmosphere combined with rain, snow, and fog remain stored in the form of ice .
* Acids usually occurs in flowering Winter.

319. **Acid Rain:-** Acid Rain has pH about 5.6. Its 3 contains are-

Gas	Source	Concentration(PPM)
Co2	Decomposition, burning of fossil fuel.	420PPM
No	Electric discharge	0.01PPM
So2	High temperature combustion, burning of fossil fuel and volcanic gases.	0.01PPM

320. **National Action Plan on Climate Change**:- NAPCC was released on 30th June 2008. The prime Minister Council on climate change in charge of be overall implementation of the plan.

321. **Joint Forest Management (JFM)**:- Joint partnership of forest between local people and Govt.

* Location- Arabari (Paschim Mednipur).

322. **Bio-piracy**:- 'Bio, means life and 'Piracy' means threat . Bio-piracy is the practice of commercially exploiting naturally occur bio chemical or genetic material.

323. **TERI**:- The Energy and Resource Institute (formally Tata Energy Research Institute) is a research institute based on New Delhi established in the year 1974.

324. **Wild Life Trust of India (WTI)**:- is an Indian non-governmental Organisation to conserve wild life and its habits to work for the welfare of wild animals.
*WTI was formed in November 1988 in response to the rapidly deteriorating condition of wildlife in India.

325. **Floristic Realm**:-

Florisitc kingdom	Place
1. ***Australian kingdom***	Australia
2. ***Cape kingdom***	Cape basin
3. ***Antarctica kingdom***	Antarctica
4. ***New Zealand kingdom***	New Zealand
5. ***Paleo-tropical kingdom***	Africa
6. ***Neo-tropical kingdom***	South America

*No. of Floristic Realms in India 9.

326. Zoo Geographical Realm:-

Zoo geographical Realms	Place
1. *Palearctic Region*	Asia
2. *Nearctic Region*	N. America
3. *Ethiopian Region*	Africa
4. *Oriental Region*	Asian desert
5. *Neo tropical Region*	S. America
6. *Australian Region*	Australia

- No. of Zoo Geographical Realms in India 10.

327. India Location:-India is the 7^{th} largest country in the world .

Extension- 8°4' N and 37°6'N Latitude and 68°7' and 97°25'E Longitude .

Area Covered – 3214km in North to south and 2933km in East to west.

328. 82°30'E Longitude is taken as the standard time India.
This meridian is known as standard meridian it passes through Mirzapur near Allahabad(UP).

329. In India **tropic of cancer** passes through 8 States like Gujarat, Rajasthan, M.P., Chhattisgarh, Jharkhand, W.B., Tripura, Mizoram.

- The tropic of cancer divides India two equal part Northern half of India lies Subtropical Zone and the South half of India lies Tropical Zone.
- India situated in Northern Hemisphere and Eastern Hemisphere.

330. The coast line of India 7516.6km (5422.6+2094).

- India share her boundaries with 7 countries like Pakistan, N/W Afganistan, China, Nepal, N/E Bhutan, Bangladesh, East Myanmar.

331. In India Uttar Pradesh are touches the boundaries of the maximum no. of the states.

332. China her maximum no. (14 countries) of neighbour touching border.

333. West to East mountain peak in Himalaya:-

- K2(8661m)>Kamet(7756m)>Nandadevi(7817m)>Dhawalgiri(8172m)>Everest(8850m)>Makalu(8481m)>Khanchangangha(8598m)>Namchabarwa(7756m).
- Kedarnath>Yamunotri>Badrinath(7138m)>Nanda Devi(77817m)>Gangotri>Gourisankar(7145m)>Everest(8850m)>Khanchangangha(8598m)>Namchabarwa(7756m).

334. Himalayan Valley west to east:-

Udaipur-Kotli Valley(Jammu)>Kashmir Valley (Pirpanchal & Zaskar)>Kangra-Kulu Valley(Himachal Pradesh)>Doon(Uttarakhand)>Patlli-Chaukhamba Valley(Uttarakhand)>Bhagirathi valley>Kathmandu Valley(Nepal).

335. Largest Physiographic Division is great Northern Plains and broadest part of Himalaya is J&K.

336. Great Himalaya range separate Kashmir valley from Indus river valley.

337. North to South sequential order of Himalaya is :-

Karakoram>Ladakh>Zaskar> Pir Panjal> Dhouladhar.

338. Trans Himalayan River:-

- *Jammu & Kashmir*- Indus, Jhelum(Kashmir valley)
- *Himachal Pradesh*- Ravi, Beas, Sutlej.

339. Major Relief and Area in India:-

Relief	Area(%)
Mountain	10.7%
Hill	18.6%
Plateau	27.7%
Plain	43%

- India has now 28 states & 9 Union Territories.

340. Important places in India:-

Type	Place
Lowest place	Kuttanad(Kerala)
Highest place	Khanchangangha(Sikkim)
Warmest place	Palodi (Rajasthan)
Coldest place	Dras valley(Kashmir)

341. Classification on the basis of organic growth (mumford 1938):

- Eco police-Big village with Primary sector dominances.
- Polis- small market town with some manufacturing.
- Metropolis-Large city with growing centrality
- Megalopolis- Highly urbanized bloated city with material facilities
- Ecumenopolis- Higjly growing city(conurbation)
- Tyranopolis- High urbanization but massive problems out of control
- Necropolis-Dead city due to epidemic, war, famine etc.

342. A planned and relatively self contained settlement developed emphasizing on spaciousness, environmental ruality and 'greenness'- Garden city.
Example- Bangalore by Howard

343. Example of best plan city in India-Chandigarh
- Hippodamus first proposed the plane city
- Le Corbusier proposed the radiant city(1924)

344. An overcrowded urban area often associated with a specific ethnic or racial population; especially because of social, legal or economic pressure-Ghetto

345. The ring of prosperous communities beyond the suburbs that are commuter towns for an urban area is known as-Exurb

346. The spreading outwards of a city and its suburbs to its outskirts to low density and auto dependent development on rural land-urban sprawl

347. Models of urban land use:
- The concentric zone model by E W Burgess (1924)
- The sectoral model by Homer Hoyt and M.R. Davis(1939)
- The Multiple Nuclei Model by C.D. Harris and Ullman(1945)

348. Picture of Urban-Landuse Model:
- Concentric
- Sectoral
- Multiple Nuclei

349. Wlater Christaller proposed theory of central places in his book, central places in southern Germany in 1933.

350. Christaller suggested three ways in which hierarchical spatial structure would be organised
Marketing Principle (K=3)
Transportation Principle (K=4)
Administrative Priciple(K=7)

351. August Losen, was the first to develop a general theory of location or theory of market centres with major emphasis on demand this theory formulated in 1940.

352. The following assumption were made by A.Losch
- There is an isotropic surface i.e. flate uniform plain
- There is constant supply of goods and services
- People is constant supply of goods and services
- Demand decrease with an increase in price

353. Settlements are classified according to their size in following manner
Megalopolis-More than 10 million people
Conurbation- 3 to 10 million people
Metropolis- The population is usually 1 to 3 million
Large city- The population is less then one million people, but over 300000 people.
City- Thee population of a city is 100000 to 300000 people
Large town- a large town has a population 20000 to 100000
Small town- 1000 to 20000 population
Hamlet- less then 100
Isolated dwelling- 1 or 2 building or families

354. The most trends of urbanization in developed countries Gentrification other trends of urbanization are
- Suburbanisation
- Urban Renewal
- Housing Improvement
- Development of conurbation an megapolis

355. As of 2017, there are 47 mega cities in existence
India has 5 megacities
China 15 megacities
US, Brazil and Pakistan each with two
African Megacities are present in Nigeria, Egypt, DRC

356. Global city is defined as a city that plays a significant role in the global economic system. It is also known as world city, alpha city or world centre.
The term 'global city' was popularised by sociologist Saskia sassen in her 1991 work, The Global City: New York, London, Tokyo.

357. Edge city refers to a city with concentration of firms entertainment and shopping centres in a area which had been earlier a rural or residential area.
The term 'edge city' was popularised by Joel Garreau' in his book 'Edge City: Life on the new Frontier on 1991.

358. Social area analysis model developed by RA Murdie in 1969, incorporates all three aspects of city structure, namely, concentric zones, sector zone, Multiple Nuclci.

359. The concept of Rural-Urban Fringe was propounded by RJ Pryor in 1968.

360. A satellite town is a concept in Urban planning which reters to smaller urban areas that are located close to the larger metropolitan areas.
- Faridabad is a satellite town of Delhi.

361. The concept of Core-Periphery is most closely associated with Friedman.

362. Dependency theory of under development popularised by Gunder Frank.

363. Cultural diffusion : Ideas, products and even cultural traits can spread from one culture to another.

364. Cultural Ecology : Cultural ecology is the study of human adaptations to social and physical environment.

365. Cultural Heritage : Cultural heritage is an expression of ways of living developed by a community. It includes customs, practices, places, objects, etc. and value of culture transmitted to human beings by their ancestors from generation to generation.

366. Cultural Realms : A cultural realms is a geographical region where cultural traits maintain homogeneity.

367. Cultural Region : A cultural region is an area that has common cultural elements and has distinct cultural authority from other regions.

368. The term 'Social Geography' was introduced by Vallaux in 1908.

369. Special distribution of social groups in India :

Zone	Tribes	Problem
North zone (Himachal Pradesh, Punjab, sub-Himalayan, Uttar Pradesh and Bihar)	Khasa, Tharu, Bhoksa, Bhotias, Gujjaras and the Jaunsaris	Inaccessibility, lack of communication, poverty, illiteracy and land alienation.
North-Eastern Zone (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura)	Nagas, Khasi, Garo, Mishing, Miri, Karbi and the Apatanis	Ecological, degradation because of shifting cultivation and inaccessibility due to lack of communication facilities.
Central Zone (Southern Madhya Pradesh to Jharkhand across Northern Orissa)	Santhal, Ho, Baiga, Abhujmaria, Muria, Munda and Bihor	Land alienation, indebtedness and exploitation of tribai girls.
Southern Zone (Nilgiris together with the adjoining hilly regions in Andhra Pradesh and Karnataka)	Toda, Koya, Chenchu and Allars.	Shifting cultivation, economic backwardness, isolation, lack of communication and threat of extinction of languages.
Eastern Zone (West Bengal and parts of Orissa)	Paraja, Kondhs, Bondas, Bhumij, Gadabas, Bhuinyas and Saoras	Economic backwardness, exploitation by forest official and contractors, land alienation, prevalence of diseases and displacement due to industrial projects.
Western Zone (Rajasthan and Gujarat)	Bhils, Garaasiya and Meenas	Displacement due to industrial projects.
Island region (Andaman and Nicobar isands, Lakshadweep and Daman and Diu	Great Andamanese, Sentinelese, Jarwas, Onges, Nicobaris and Shompen	Economic backwardness

370. Special distribution of language:

Language	Family	Official Recognition in state
Assamese	Indo-Aryan, Eastern	Assam, Arunachal Pradesh
Bengali	Indo-Aryan, Eastern	West Bengal, Tripura, Assam, Andaman and Nicobar Island, Jharkhand
Bodo	Tribeto-Burman	Assam
Dogri	Indo-Aryan, North-Western	Jammu and Kashmir, Himachal Pradesh, Punjab
Gujarati	Indo-Aryan, Western	Dadra, and Nagar Haveli, Daman and Diu, Gujarat
Hindi	Indo-Aryan	Andaman and Nicobar Islands, Bihar, Chandigarh, Dadra and Haveli, Chhattisgarh, Delhi, Gujarat, Hayrana, Himachal Pradesh, Jharkhand, Jammu and Kashmir, Madhya Pradesh, Mizoram, Rajasthan, Uttar Pradesh, Uttarakhand and West Bengal
Kannada	Dravidian	Karnataka
Kashmiri	Indo-Aryan, Derdic	Jammu and Kashmir
Konkani	Indo-Aryan, Southern	Maharashtra, Goa, Karnataka and Kerala
Maithili	Indo-Aryan, Eastern	Bihar, Jharkhan
Malayalam	Dravidian	Kerala, Lakshadweep, Puducherry, Andaman and Nicobar Island
Manipuri	Tibeto-Burman	Manipur
Marathi	Indo-Aryan, Southern	Maharashtra, Goa, Dadra and Nagar Haveli, Daman and Diu
Nepali	Indo-Aryan, Northern	Sikkim, Darjeeling, Uttarakhand and some parts of North-East India
Odia	Indo-Aryan, Eastern	Odisha, Jharkhand, West Bengal
Punjabi	Indo-Aryan, North western	Chandigarh, Delhi, Punjab, West Bengal
Sanskrit	Indo-Aryan	Uttarakhand
Sindh	Indo-Aryan, North western	Sindh
Tamil	Dravidian	Tamil Nadu and Andaman Nicobar Island, Puducherry
Telegu	Dravidian	Andhra Pradesh, Telangana, Puducherry, Andaman and Nicobar Island
Urdu	Indo-Aryan, Central	Jammu and Kashmir, Telangana, Jharkhand, Delhi, Bihar, UP, WB
Santhali	Munda	Assam, Bihar, Chhattisgarh, Mizoram, Odisha, Tripura, Jharkhand, WB

371. Heartland theory was propounded by Halford Mackinder. in 1904, he Submitted an article 'The Geographical Pivot of History'.
    - In 1919 Mackinder published extended version of his 1904 paper in book form entitled ' Democratic Ideals and reality'.

372. Rimland Theory was propounded by spykman in 1942 in opposition to the Heartland Theory of Mackinder.
    - This theory was published by spykman in his book entitled 'The Geography of Peace' (1944).

373. International boundary demarcated before economic, Social and Political development of nation-state is called Antecedent boundary.
    - Example- Australia, North-America, South-America, Canada, etc.

374. International boundary demarcated after Social, Economic and Political evolution and development of concerned Nation-state with its mutual consent is describe as subsequent boundary.
    - Example- Border between India and Myanmar.

375. International boundary demarcated or imposed on an area by an outside or conquering power is called superimposed boundary.
    - Example- Boundary between North and South Korea.

376. International boundary that have been removed or eliminate due to integration of concerned nation-state is defined as relic boundary.
    - Example- North and South Vietnam.

377. City of Death : The city suffers from lack of city services and amenities and social problem, like social tension, poor housing, sociocultural deprivation, the people living pay machine tax, death tax.

378. City of Need : Intermediate zone, occupied by blue collar working class exploited by business interest and politicians.

379. City of superfluity : Outer most zone, occupied by elite entrepreneurs, professionals and managers. They Spear life with leisure and luxury.

380. As per K3 principle of settlement hierarchy, if total number of settlement is 81 then how many will be the 1st order settlement?-54.

381. The regularity between the sizes of cities and there rank was first noticed by F. Auerbach.

382. Who proposed the rank size rule and attempted to express this relationship mathematical terms- G.K. Zipf 1949.

383. The idea of primacy was first formulated by- Mark Jefferson.

384. "Wedge like expansion" is the example of sector theory.
    - "Cellular structure" is example of multiple nuclei model.

385. When did Mark Jefferson presented his theory "The Law o Primate City"-1939.
- The relationships between the largest city in a region is called- Primate City.

386. The hierarchy order for settlement given by Christeller, in which the number of settlements at progressively less specialized level follows which of the following Geometric progression- 1, 3, 9, 27……(number of settlement growth).

387. K=7Hierarchy order implies- 1,7,49,343……(number of settlement of growth).

388. A technique of CBD land used Analysis was devised by- Murph and Vance.

389. On the basis of age (J.M. Hutson):
- Nuclear stage-Ancient city (aged).
- Formative stage- cities following industrial revolution.
- Morden stage- cities with fast growth and formation of suburb, exurb etc.

390. The main source of Population Data is the Census Data and other source –
i) Survey Method ii) Registration Data.

391. The World Population Distribution is Asia $2/3^{rd}$, North Central and South America together have olnly 1/7 of the Population.
Africa – 1/10 th of the world Population
Europe – 1/9 th of the world's People

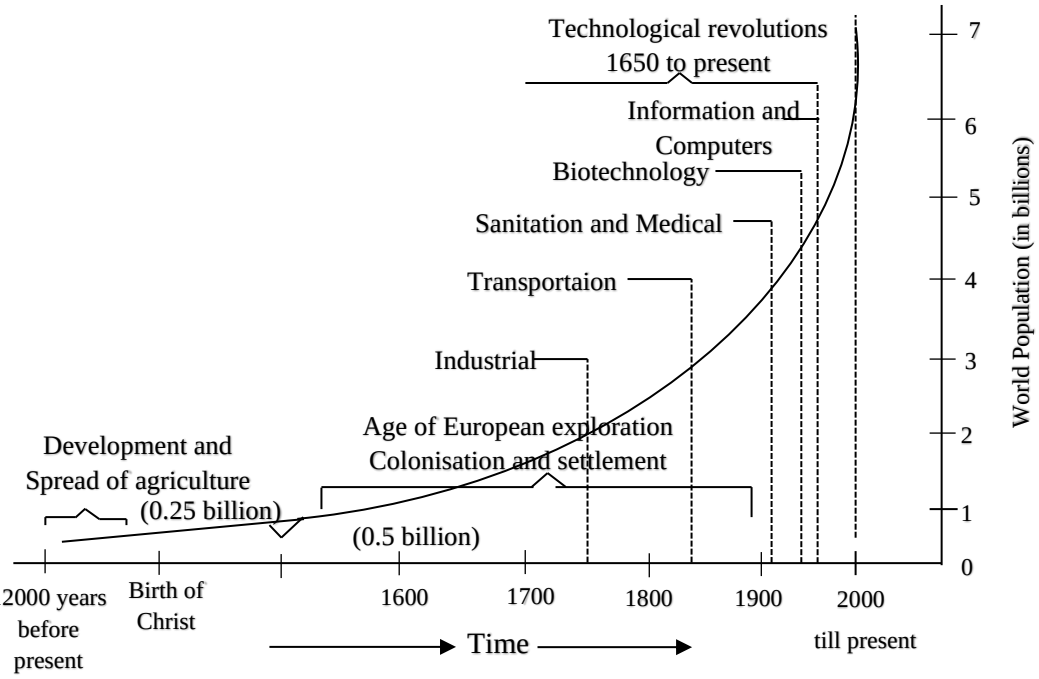
392. The slowest Growth rate continent is America (2.1%) annually.
Africa – (2.6%)
Asia – (2.3%)
Within each continent there are further differences as larger areas of tropic South America and Central America are growing at 3% or more with South-East and South – west Asia not far behind.

393. World Wide human Population Density is around 14.7 per km^2.

394. Pattern of world Population Distribution

Region	Population Density (sq km)
World	51.80
Asia	102.85
Africa	43.57
Europe	33.57
Latin America	34.29
North America	14.83
Oceania	4.93

395. World Population Growth : Prehistoric to Modern times.



396. At the beginning of Industrial Revolution, the Population growth rate was 0.12% per annum. Thereafter the Population grew at an accelerated rate which increased to 1.0% in 1930 and 2.1% in 1960s.

397. In Developed countries Population growth rate has solved down to 0.1% a year and in developing countries it is over 1%.

398. As of Mid-2017 World's Population is nearly 7.6 billion , 60% of world people line in Asia, 17% in Africa , 10% Europe, 9% Latin America and the Caribbean (646 million) and 6% North America and Oceania (41 million).

399. China and India remain the two most Popular countries of the world, consisting 19% and 18% of the global total respectively.

400. Growth of world Population.

Year	Population in Million	No. of years to add one billion people
10,000 BP	5	
1 AD	200	
1000 AD	300	
1750	800	
1850	1000 (1 billion)	
1930	2000 (2 billion)	80 years
1962	3000 (3 billion)	32 years
1975	4000 (4 billion)	13 years
1987	5000 (5 billion)	12 years
1998	6000 (6 billion)	10 years
2012	7000 (7 billion)	13 years
2025	8000 (8 billion)	14 years
2050	about 10,000 (10 billion)	25 years

401. Ten years ago, global Population was growing by 1.24% per year. Today, it is growing by 1.10% per year.

402.

Population Resource Region	Description
i) United states types ⟶	This is also known as technology source area of low Population potential resource ratio.
ii) European types ⟶	It is also known as technology source area of high population potential Resource ratio.
iii) Brazilian types ⟶	It is caved technology deficient areas of low population Resource ratio. Ex: tropical and Latin America Region.
iv) China or Egyptian types ⟶	It is known as technology deficient areas of high population resources ratio. Ex: Egypt, China, India, Pakistan, Bangladesh, Nepal etc.

403. The Demographic transition theory was originally given by WS Thompson in (1929) and was revised by Frank W. Notestein in (1945).

404. Stage of Demographic Transition theory.

Stage	Description
i) (High and Fluctuating) ⟶	Stage of High Birth and Death rates and slow population Growth.
ii) (Early Expanding) ⟶	Stage of High Birth Rate and Low Death Rate
iii) (Late Expanding) ⟶	Stage of Declining Birth rate and low Death rate and Slow population growth. Ex: America, Europe, Japan etc.
iv) (Low Fluctuating) ⟶	Stage of low Birth Rate, Low Death Rate and stationary population. Ex: Australia, Newzeland, Singapore, Hong Cong etc.

405. Population Resource Region postulated by Ackerman.

406. Thomas Robert Malthus (1766 – 1834) published 'An Eassay on the principle of population in (1798)'.

407. Theory of population growth.

Theory	Description
Malthusian theory (1766 – 1834)	Population increases in geometrical ratio (1, 2, 4, 8 …) on the other hand subsistence increases only in arithmetic ratio (1, 2, 3, 4, 5 …..)
Recardo's theory (1772 – 1823)	Theory of comparative advantage and theory off rents.
Thomas Saddler's (1780 – 1835)	The natural Law of population growth was exactly opposite to that expounded by Thomas Malthus.

408. The book "The Law of population" written by Thomas Saddler (1830).

409. Crude Birth Rate :- It is the Ratio of total registered live births to the total population during a specific years , multiplied by 1000.

Formula $\frac{B_1}{P} \times 1000$

410. Fertility Ratio / child women ratio :- It is the ratio of numbers ,of children below five years of age to the females of reproductive age group (15 – 49 years).

$$\frac{P_0 - 4}{Pf_{15} - 49} \times 1000$$

411. General Fertility Ratio :- It measures the number of live births in a year per thousand women of normal Reproductive age (15 – 49 age)

$$GFR = \frac{B_1}{Pf_{15} - 44} \times 1000$$

412. Age specific Birth Rate :- It measures the number of birth in a year to women of a given age group per thousand women in the age group.

$$ABR = \frac{B_{20} - 24}{Pf_{20} - 24}$$

413. Total Fertility Rate :- It refers to average number of children that would be born alive to a women during her lifetime.

414. Reproduction Rate :- It indicate the replacement of individuals by others of same age groups in the following generation.

415. Crude Death Rate :- It Indicates the number of deaths in a particular year per thousand of population.

$$CDR = \frac{D}{P} \times 1000$$

416. Age Specific Death Rate :- It indicates the variations in mortality with age.

$$ASDR = \frac{\text{Number of death in the year in an area in the age group (xto xtn)}}{\text{Mid – year population of the area in the age group (Cx to xtn)}}$$

417. Infant Mortality Rate :- It indicates mortality among children of less than one year of age.

$$IMR = \frac{D_0}{B_1} \times 1000$$

418. World pattern of mortality.

Region	Crude Death Rate (in %)	Infant Mortality Rate (in %)	Under Five Mortality (in %)	Old Age mortality (in%)	Adult mortality (in %)
World	7.7	33	48	55	144
Africa	8.9	53	87	25	260
Asia	7.0	28	38	58	130
Europe	11.0	5	6	77	117
Latin America and Caribbean	5.9	17	24	56	134
North America	8.2	6	7	75	99
Oceania	6.7	20	26	70	91

419. First formal attempt to postulate "Laws of migration" was done by Ravenstein in 1885.

$$\text{Migration } \alpha \frac{1}{\text{Distance}}$$

420. Jhon Q Stewart was the first to point the isomorphic relationship of population movements with Newton's laws of gravitation. This later come to be known as "Gravity model".

$$MI = \frac{KP_1P_2}{D^2}$$

421. In 1940, George K zipf applied the 'principle of least effort' to the movement of goods, information and people with in the social system.

$$Mij = k. \frac{P_i P_j}{D_{ij}}$$

422. In 1940, S A stouffer introduced the concept of intervening opportunities in an attempt to improve upon zipf's 'principle of least effort'.

$$Y = \frac{X^*}{X}$$

423. Mobility transition model of migration was given by Zelinsky in 1971. Zelinsky proposed that change in migration behaviour are in synchronisation with stages of demographic transition model.

424. Everett Lee propounded a model of Migration in 1965.
Factors operating in area of origin and destination.
Factors that act as intervening obstacles.
Personal factors that are specific to individual.

425. Age structure by Region, 2017

Region, Country or Area	population by broad age group (percentage)			
	0-14	15-24	25-59	60+
World	26	16	46	13
Africa	41	19	35	5
Asia	24	16	48	12
Europe	16	11	49	25
Latin America and Caribbean	25	17	46	12
North America	19	13	46	22
Oceania	23	15	45	17

426. Sex ratio of the world 102 males to 100 females.

427. Developed countries like japan , USA, Singapore, Canada etc. are following policy of slow growth, also known as policy of pronatalism.

428. Cross section data : where the data are collected from a selection of population in respect to a particular group of variable at a paint of time.

429. The first census of history was published in – 1749 from Sweden.

430. India planned to start a census since – 1865 and first regular census in India – 1872.
First complete census was published – 1881.

431. Growth Rate at a glance in India :
Period of stagnant population – 1907 – 1921
Period of steady growth – 1921 – 1951
Period of high growth – 1951 – 1981
Period of high growth but having sing of declinist – 1981 onward.

432. Population when move to other countries from native nation's point of view it is – Emigration.

433. Population when infiltrate to the one country , from receiving country's point of view it is called – Immigration.

434. Mass Scale migration from one place to another place due to repulsive and attractive forces is called – Exodus.

435. Ranking of states by Population size in 2011

Rank in 2011	State	Total Population	Males	Females
1	Uttar Pradesh	19,9581,477	10,45,96,415	9,49,85,062
2	Maharashtra	11,23,72,972	5,83,61,397	5,40,11,575
3	Bihar	10,38,04,637	5,41,85,347	4,96,19,290

436. ***Concentric zone theory*** proposed by *E.W. Burges (1927).*
These study, developed in Chicago school of sociology (1923).

437. ***Concentric zone theory*** applicable for Anglo America, Australia, western countries
438. In concentric zone theory transition zone also called grey zone.
Twilight or urban blight zone (industry /factory work).

439. 341.***Sector theory*** proposed by *H. Hoyt (1939) and Davie*.

440. 342.***Sector theory*** developed in USA.
343. According to that model city may grow in a virtual form.

441. ***Multiple nuclei theory*** proposed by *C.D. Harris and E.L. Ullman in 1945.*
442. ***Application of morphological model*** in Indian cities was mode by *Rajagopalachari (1963).*
443. 344.***Exploitative model*** proposed by *William Bunge (1957).*
345.This model services decreases from core to periphery:-
a) inner city (slum/poor people)
b)the intermediate city c)the city of superfluity

444. ***Social area analysis*** proposed by *E. Shevky and W. Bell (1955)*.
445. 1. ***Dynamic theory*** proposed by *Colby.*
- *Kerley* modified Burges model.
- Urban Living model proposed *Venice.*

Twenty first century city model proposed by *white.*
446. 346.***Social area analysis***:-
* *Ethnic status* (Segregative)- race, Language, culture.
* *Family status (*concentric)- age, family, household.
* *Socio economic status* (Sector)- education, occupation ,income .

447. ***Theory of ecological process of urban growth*** proposed by *Robert Park* (essay on human ecology).
448. 13. ***Invasion and succession theory*** proposed by R.D. Mekenzie.
449. 14. The term *'urban fringe'* propounded by Pryor (1968).
450. The ***concept of rural urban fringe*** has been first of all developed by *Von Thunen (A.D.1826).*

AUTHOR	TERMS
Andrews	Urban fringe
Reinemann	Outxing Adjacent zone
Myres & Begle	True fringe
White hard	Inner fringe belt
R.B.Mandal	Sub-urban zone

451. ***Central place theory*** propounded by *Walter Christaller* in 1933.

452. ***Central place theory*** explained by 3 concepts with it
a) Centrality
b) Threshold
c) Range of central good.

453. **Hierarchy of central place**:-
K=3 (*market principle*)
K=4 (*transport principle*)
K=7 (*administrative principle*).

454. **Rank Size Rule:-** was reordered by scholar in the early decode of the present century- *F. Auerbach (1913).*
* It was popularized by G.K. Zipf (broke national unity and disimity) in 1949.
Formula:- Pr =p1/rq
[Where:
Pr =population of a town of rank r
P1 =population of the largest town/first unit town
rq =rank of the town]

455. ***The law of primate city*** introduced by *Mark Jefferson (1939).*

456. **Definition of village according to census Ayog** -
1) Population less than 5000
2) Density of population <400 person/ Sq. k.m.
3) 75% people are engaged in non-agricultural sector.

457. The ***concept of 'Umland'*** propound by *Andre Allix (1914).*
- Urban settlement are called town & city (U.K.), cite (France), Staden (Sweden).

458. **Classification of Town**

Type of town	population
Class I town	100000 or >
Class ii town	50000-99999
Class iii town	20000-49999
Class iv town	10000-19999
Class v town	5000-9999
Class vi town	<5000

459. ***Functional classification of urban centre*** by C.D. Harris (1930) classified in to 9 classes and H.J. Nelson (1950) classified into 10 classes basis on :- $\alpha=\sqrt{d2/n}$.

460. *Louis Mumford* classified ***urban settlement*** based on size:-

a) *Eoposis*:- very short urban settlement
b) *Polis*:- shape of polis is short town
c) *Metro-polis*:- mother city (population<10 lakh)
d) *Megalopolis*:- large size town(population<1 core)
e) Tyranopolis :- whole country population transform into urban settlement
f) Ecumonopolis:- whole world population transform into urban settlement
g) *Necro polis*:- dead town

461. **West to East passes**:-

Banihal>Zojila>Berlachala>Sipkila>Lepu lekh>Nathula>Bomdila

462. **Different passes**:

Passes	location	Connection
Banihal (Longest tunnel in world)	J & K	Jammu & Srinagar
Zoji la	J & K	Srinagar & Leh
Burzi la	J & K	Kashmir valley & Ladakh
Khardung la	J & K	Leh & Nubra Valley
Sipki la	Himachal Pradesh	Himachal Pradesh & Tibet
Rohtang	Himachal Pradesh	Kulu & Spiti Valley
Jelep la	Sikkim	Sikkim & Lasa
Lepu lekh	Uttarakhand	Dehradun & Tibet
Nathu la	Sikkim	Sikkim & China
Mana	Uttarakhand	Dehradun & Tibet
Bomdi la	Arunachal Pradesh	Arunachal Pradesh & Tibet

463. **Mountain and highest peak in India**:

Mountain	Highest peak
Nilgiri	Dodabeta(2637m)
Satpura	Dhupgarh(1350m)
Aravali	Guru sikhar(1722m)
Western Ghat	Vabulmala(2399m)
Eastern Ghat	Jindagada(1680m)
Anaimalai	Anaimudi(2695m)
Bindha	Manpur(881m)

464. **North to South Passes**:-

Passes	Location	Connection
Haldi ghat	Rajasthan	Rajsama & pali
Goran ghat	Maharastra	Udaipur & Sirohi
Thal ghat	Maharatra	Mumbai & Pune
Bhore ghat	Maharastra	Mumbai & Nasik
Pal ghat	Kerala	Nilgiri & Cardamom

465. **Irrigation in India**:-

Types	% area in India
Canal	32.04%
Tubewell	55.68%
Tank	11.28%

Indira Gandhi Canal(Rajasthan) is the largest canal in India. Its connect Sutlej and Beas River.

466. **River Project**:-

River	Dam/Project
Narmada	Sarder Sarobar & Indira sagar Dam
Beas	Pong Dam
Chenab	Salal Project
Sutlej	Bhakra Nangal Project
Bhagirathi	Tehri Dam
Mahanadi	Hirakund Dam
Jhelum	Mongla Dam
Betwa	Mata teela Dam

467. **Water Fall In India**:-

River	Waterfall
Narmada	Dhuandhar
Kaveri	Sibsamudram
Machkynd	Dudma
Varahi	Kunchikal(Highest)
Sarabati	Yoga

468. **Boundary with connected area**:-

Boundary	Connected area
Red cliff(L.O.C) line	India & Pakistan
Mc. Mohan(L.A.C) line	India & China
Durand line	Pakistan & Afghanistan
10 Channel	Andaman & Nicobar
8 Channel	Minicoy & Maldives
9 Channel	Lakhadeep & Minicoy
Dancan Passage	Great & Little Andaman
Hinderbag line	Germany & Poland
49th Parallel	USA & Canada
38th Parallel	North & South Korea

469. **Largest coastline in India** is located in Gujarat(9).
Northern flowing river of Himalaya is Antecedent River.

470. **Total forest area** in India Is 19.45%.

- Area wise highest to lowest forest covering state in India are Madhya Pradesh> Arunachal Pradesh>Chhattisgarh >Odisha.
- % wise highest to lowest forest covering State in India are Mizoram(76%)>Manipur>Himachal Pradesh>Andaman & Nicobar Island.

471. **Forest in Himalaya**:-

Forest	Height	Trees
Alpine	3000-5000m	Rhododendron, Juniper, Fir Pine.
Montana	1800-3000m	Oaks, Hemlock, Devdhar Birch
Evergreen & Deciduous	1000-3000m	Oak, Chestnut, Beach

472. **Classification of Vegetation according to Raunkiaer**:-

Vegetation Zone	Sign of Koppen	Region	Temp. (°C)
Megatherms	A	Tropical rain forest	25-27
Xerophytes	B	Sami arid desert	27-32
Mesotherms	C	Mid latitude temperate	18-24
Microtherms	D	Evergreen deciduous steeps	12-17
Hekistotherms	E	Tundra	0-10

473. **About monsoon Climate:**-

- Tropical easterly jet famous for the onset of south west monsoon.
- Monsoon Brust occur by south western monsoon in Malabar Coast.
- Western disturbance occur mainly north western part of India.

474. **Soil % Area in India**:-

Soil	% of area
Alluvial **	46
Black	17
Red	11
Mountain	8.7
Laterite	8
Dry	4.5

****Alluvial soil are called Bhanger(old alluvial) and Khader(new alluvial) in Uttar Pradesh & Dyaya(old alluvial) and Bet(new alluvial) in Punjab.**

475. **Type of Soil**:-The concept of Soil classification based on regional climate was first developed by *Sibirtzev* in Russia.

- *Zonal Soil*:- Chernozem, Podzol, Laterite,
- *Inter-zonal soil*:- Solonchak (white alkali), Solonetz(black alkali)
- *Intra-Zonal soil*:- Alluvial, Loess, Lithosols, Regosol.

476. **Crop Distribution**:-

Crop	Temp.(°C)	Rainfall(cm)	State production sequential
Paddy	20-30	100-150	W.B>U.P.>Andhra Pradesh
Wheat	15-20	50-70	U.P.>Punjab>M.P.>Haryana
Sugar cane	20-26	75-100	U.P.>Maharashtra>Karnataka
Cotton	25	110	Gujarat>Maharashtra>Andhra Pradesh>Punjab
Tea	20-30	150-200	Assam> W.B.>T.N.>Kerala
coffee	14-26	175-300	Karnataka> Kerala>T.N.

477. **Agricultural Revolution**:-

Revolution	Agriculture
Green	Paddy/wheat
White	Milk
Blue	Fish
Pink	Prone
Grey	Fertiliser
Yellow	Oil seed
Rainbow/Food chain	All agricultural production
Golden	horticulture

478. **Atomic Energy centre in India**:-

- Tarapur(Maharashtra)
- Rawatbhata(Rajasthan)
- Kalpakkam(T.N)
- Narora(U.P.)
- Kudankulam(T.N.)
- Kakrapara(Gujarat)
- Kaiga(Karnataka)

479. **Water energy on river project**:-

Water energy	River
Salal	Chenab
Dehar	Sutlej
Jaharsagar	Chambal
Chiplima	Mahanadi
Mettur	Kaveri
NijamSagar	Godavari

480. **Different energy**:-

- *Solar energy*:- Gujarat, Rajasthan, Andhra Pradesh, Pondicherry.
- *Tidal energy*:- T.N., Gujarat coast, Sundarban,
- *Air energy*:- T.N.(Mupandal), Gujarat(Lambha),
- *Geothermal energy*:- Himachal Pradesh(Manikaran),Chhattisgarh.

481. **Raw material**:-

- *Ferrous Metallic*:- Iron, Nickel, Chromium,
- *Non-Ferrous Metallic*:- Copper, Lead, Zinc, Aluminium
- *Non-Metallic*:- Mica, Asbestos, Sulphur,
- *Refractory*:- Kyanite

482. **Raw material in India**:-

Raw material	Location
Copper	Khetri, M.P.(1st), Rajasthan(2nd) Jharkhand(3rd)
Iron ore	Kudremukh
Manganese	Balaghat(M.P.)
Baxite	Odisha(1st), Gujarat(2nd)
Gold	Karnataka(kolar), Andhra Pradesh(Chigangunta)
Tangstain	Rajasthan, W.B.(Bankura)
Coal	Chhattisgarh(Korba), Jharkhand(Jharia[longest]), W.B., Tamil Nadu(Neyveli[largest lignite])

483. **Cotton Indusry**:- Ghusuri in Howrah is the first cotton industry in India. It's also called Foot Loose Industry (M.I.=<1 or 1).

- *Cotton polis of India*- Mumbai(63 miles)
- *Manchester of India*- Ahmedabad(73)
- *Manchester of Southern India*- Coimbatore
- *Manchester of Northern India*- Kanpur

484. **The first paper industry** was established in Srirampur in 1832.

*The first newsprint industry is located in Nepanagar in M.P.

Steel plants in India:-

Location	Assistance	Water(river)
TISCO(1907)	TATA	Kharkai, Subarnarekha
Rourkela(1959)	Crups & demag(Germany)	Bramhani
Bhilai(1957)	USSR	Tandula
Durgapur(1959)	ISKON(U.K.)	Damodar
Bokaro(1964)	USSR	Damodar
Burnpur(1918)	W.B. Govt.	Damodar

485. Total Agro-climatic region in India is 15.
Highest urbanised state of India is Maharashtra.

486. Sundarban Biosphere Reserve deserved World Heritage Site in 1987 and UNESCO in 1989.

487. No. of Indian Metrological Station in India are 6(Channai, Guahati, Kolkata, Mumbai, Nagppur, New Delhi).

488. Railway Track :-

Gudge	Length
Broad	1.68m
Mitre	1m
Naro	0.762m

489. **Highway in India**:-

- *Kolkata to Delhi* – NH2
- *Varanasi to Kanyakumari*- NH7
- *Delhi to Mumbai*- NH8
- *Srinagar to Kanyakumari*- NH44
- *Shortest Highway*- NH47A

490. **Different Harbour**:-

Natural Harbour	Artificial Harbour
Kochi, Mumbai, Kandla, Vizag, New Mangalore	Kolkata, Haldia,Channai,Paradeep.

491. **Railway zone(17)**:-

N(Delhi),NE(Gorakhpur),NEFrontier(Guahati),E(Kolkata),SE(Kolkata),SC(Secendrabad),S(Channai),C(Mumbai),W(Mumbai),SW(Huballi),NW(Jaipur),WC(Jabalpur),NC(Alahbad),SEC(Bilaspur),ECoast(Bhubaneswar),EC(Hajipur),Metro(Kolkata).
*(Where E=East, W=West, N=North, S=South, C=Central)

492. **International Airport in India**:-

- *Sibaji*-Mumbai
- *Netaji Subhas*- Kolkata
- Indira Gandhi-Delhi
- *Jawharlal Neheru (Navaseva)*-Maharashtra

493. **River and Tributaries with source**:-

River	Origin	Tributaries	Town besides
Ganga	Gangotri glacier		
Sindh	Sinkabab Glacier		
Bramhaputra	Chamayongdung		
Mahanadi	Siowa lake		
Godabari	Bramhagiri kunda mountain		
Krishna	Mahabaleswar		
Kaveri	Bramhagiri Tal		
Narmada	Amarkantak Hill		
Tapi	Mahadev mountain		

494. ***Arab geographers*** : - *Ibn Haqul(943-973AD)- *'A book of routs and realms'*

*Al masudi (985AD)-16 climatic regions. '*Conception of the spericity of the earth'*.

* Al Idrishe(1099-1180AD)- "*Amusment for him who desire to travel around the world'*.

Ibn Batuta(1304-1368AD)-'Rihlah'*

* Ibn khaldun(1342-1405AD)-Founder and father of modern historiography. His books *'Muquaddimah'*.

Al Balakhi(921AD)-'Kitab ul ashkal'*

*Al biruni (1030AD)- *'Kitab ul hind'*

*Ibn sina, *Al maqdisi- 14climatic regions.

495. **Time geography**:- The founder of time geography was T. Haggerstrand(1970). He said , "Time has to be taken into account along with space".

*supporters – Allan Pred (1936-2007).

His concept 'place, practice and structure'(1986).

496. **Post- Modernism**:- The concept 'postmodernism' first introduced by Arnold .J. Toynbee(1934).

497. **Phenomenology**:- Its meaning is Appear. E.G.A. Husserl first established philosophical school of phenomenology.

*supporters- E.Relph(1970), Yi-fu- Tuan(1971), David C. Mercer and J.M. Powell(1972), A. Buttimer.

498. **Structuralism(France):-** supporter- Clad-levi-staus(Father), C. Levi Stauss, Jean Piaget, Devid Hervey, Derek Gregry.

499. **Paradigm shift:-** paradigm shift concept first introduced by Thomas kuhm(1962). Scheafer who brought about change of paradigm .

500. **Greek Geographers chronology**:

Homer>Thales >Anaximander >Hecateous >Herodotus>Plato>Aristotle>Alexander>

Hipocratus>Pythius>Polibious>Hiperchus>Posidnious.

Roman geographers: - Strabo>Ptolemy