	Structural Geology 2016- Model Questions
1.	Define a shear zone. With neat sketches, describe the characteristics of a fault and a ductile shear zone and note the differences.
2.	What are shear zones? Describe the general characteristics of a shear zone.
3.	What are shear zones? Describe the four types of shear zones.
4.	With a neat sketch describe the main types of shear zones.
5.	What are mylonites and cataclasites? Describe.
6.	What are mylonites? With a neat sketch show how are they formed.
7.	What is a shear zone. List 12 Common shear-sense indicators.
8.	Discuss how offset markers and deflated markers can be used in finding the sense of shear in a shear zone. Illustrate your answer with neat figures.
9.	What is a shear band in a shear zone? Describe S-C Fabrics and explain how they can be used as sense of shear.
10.	What are S-C Fabrics and explain how they are used in finding the sense of shear. Explain your answer with suitable figures.
1.	.Name most Common shear-sense indicators. What are S-C Fabrics and explain how they are used in finding the sense of shear. Explain your answer with suitable figures.
2.	What are shear bands and S-C fabrics? How are they used in determining the sense of shear in a shear zone.
3.	Write a note on mica fish.
4.	What is mica fish? How it is formed? Describe its use as a tool to find the sense of shear in a shear zone.
5.	Describe the origin of the shear zone related Veins and show how they are used as shear-sense indicators.Illustrate your answer with neat sketches.
6.	Describe the main evidences on the continental drift as given by Alfred Wegner
7.	Discuss how apparent polar wandiering supports continental drift.
8.	Describe how paleomagnetic study of the ocean floor supported the theory of sea-floor spreading proposed by Harry Hess.
9.	Distinguish between continental drift and plate tectonics
10.	Where do you expect to find the youngest oceanic lithosphere and why?
11.	Why are there paleomagnetic stripes on the ocean floor? Describe

12.	List the major evidences for continental drift.
13.	Explain the difference between (a) the convection model of plate motion, in which he mantle carries the plates, and (b) a model in which the plates themselves drive plate tectonics.
14.	Describe the evidences of sea-floor spreading?
15.	Name the different types of plate boundaries and give their characteristic. Illustrate your answer with figures wherever necessary.
16.	Name all major and minor plates on earth.
17.	Name the major and minor plates which are entirely oceanic plates.
18.	What are ridge-push and slab-pull forces and explain their role in plate tectonics.
19.	Explain the recent concept of driving mechanism for Plate Tectonics. What drives plate motion?
20.	What are transform plate boundaries? What are the characteristics of such a plate boundary?
21.	Give the characteristics of divergent and convergent plate boundaries.
22.	Write very briefly the theory of plate tectonics.
23.	Describe the four main types of evidence that Wegner gathered to substantiate the continental drift hypothesis.
24.	What is meant by sea-floor spreading? Where are the places on that active seafloor spreading is occurring today?
25.	Describe how Vine and Mathews related the seafloor spreading hypothesis to magnetic reversal.
26.	Where does the new lithosphere form? Where is it consumed.? Describe it.
27.	Briefly describe the process of continental rifting. Where are they occurring today?
28.	Describe the three types of plate boundaries.
29.	How does crust form along a midoceanic ridge?
30.	Why are midoceanic ridges are high, without or thin sediment cover and with high heat flow, high seismicity with shallow depth, and associated with volcanism?
31.	What is Wilson cycle? With neat sketches describe the systematic stages of formation of a supercontinent as proposed by Tuzo Wilson.
1.	Discuss in brief the driving mechanism for plate tectonics. With neat sketches show all the forces acting on plates.
2.	With neat sketches discuss the tectonic processes that occur along an oceanic-continental and oceanic-oceanic convergent plate boundaries.

3.	Show with neat sketches the configuration of various depositional basins in continental margin arc and Island arc settings (3). Discuss origin and nature of the rock assemblages of an accretionary prism in a subduction zone (7).
1.	Contrast the geologic features of a continent-continent convergent plate boundary with those of an ocean-ocean plate boundary. Illustrate your answer with suitable diagrams.
2.	What are continental margins? Describe passive and active continental margins.
3.	With neat sketches describe how subduction boundaries are initiated along a passive continental margin and in an ocean basin.
4.	Discuss the modern idea about the driving mechanism for plate tectonics. What drives plate motion?
5.	What are hotspots and Mantle plumes? Describe the five evidences of the existence of mantle plumes.
32.	What are ridge-push and slab-pull forces and explain their role in plate movements. Draw figures wherever necessary.
33.	What is kinematic analysis and its goal in structural geology? Explain.
34.	What do you understand by, translation, rotation distortion and dilation? Explain with suitable figures. Describe the deformation of a body during translation.
35.	What is rock deformation? How is it achieved?
36.	What are pure translation and pure dilation and pure distortion?
37.	What is strain analysis? Explain.
38.	Define rigid-body and non-rigid body deformation. Give the characteristics of non-rigid body deformations. Illustrate your answer with neat sketches.
39.	Define rigid-body and non-rigid body deformation. Give the characteristics of rigid body deformations. Illustrate your answer with neat sketches.
40.	Give the equations for calculation of extension (e) and stretch (S). Also show the relation of Stretch with extension.
41.	With neat sketches describe simple shear and pure shear.
42.	Define angular shear and show how angular shear strain is calculated.
43.	Define and describe a strain ellipsoid.
44.	Define Hooks Law and Young's modulus. Define the relation between the stress, strain and Young's modulus.
45.	Define Poisson's ratio and poisson's effect and show their relationship.
46.	What is Load-displacement curve and stress-strain diagram. (show with diagrams) .

47.	Draw a Mohr stress diagram at three distinctly different confining pressure conditions.
48.	Describe the plastic behavior of rocks with a stress-strain diagram.
49.	Define a plastic body. And with a neat diagram show an ideally plastic deformatio
50.	Name the factors responsible for the mechanical response of rocks to stress.
51.	Name the five main mechanics of deformation. Name the main factors that affect the deformation mechanism.
52.	Describe the simplified deformation map showing the general condition where each deformation mechanism dominates.
53.	Describe the basic principles of microfracturing, cataclasis, and frictional sliding.
54.	What do you mean by mechanical twinning and kinking. Describe the mechanics of this deformation.
55.	What is creep? Name different types of creeps. With a neat sketch describe Diffusion creep.
56.	With neat sketches, describe dissolution creep.
57.	What are the fundamental differences between the diffusion, dissolution, and dislocation creeps.
58.	Write a note on Strain Recovery and Recrystallization in the process of deformation.
59.	Describe different types of dislocation creeps.
60.	What is stress? Define it. Find out the magnitude of stress created by a cube of a granitic rock with 2 m sides and resting on a column of marble with 1 m diameter (given- density of granite = 2.7g/cm3 and g= 9.8 m/s2).
61.	Define force, stress and strain (1). Calculate the magnitude of the stress (in MPa) at a depth of 1000 m below the surface underlain by a granitic body of 1 km^2. Given: density of granite=2.7g/cc, g= 9.8 m/s2.
62.	Show all the components of stress in a cube face created by a force acting at an angle oblique to the face. Also, derive the equation: $\sigma N = F/A \cos 2\theta$ $\sigma S = F/A \sin\theta.\cos\theta$ the values of normal and shear stresses acting on an inclined plane produced by a force F.
63.	What is a Mohr's circle or a Mohr's stress diagram? Describe the method of construction of a Mohr stress circle and its use.
64.	What is a Mohr Stress Diagram? Describe the method of construction of a Mohr Stress Diagram. Using Mohr Stress Diagram determine graphically the normal stress (σn) and Shear stress (σs) values for a plane whose normal makes an angle of $\Phi = -30^0$ with respect to the direction of greatest principal stress (σ1). Given: σ1 = 40 MPa and σ3 = 20 MPa

65.	Define Young's Modulus and its relationship to stress and strain. Describe with a neat diagram the stress-strain diagram during a deformation. Also with a neat sketch describe plastic behavior of rocks during deformation.
66.	Name the six most important factors influencing the behavior of rocks during a deformation? With a diagram explain the deformation of rocks under varying temperature conditions.
1.	What is Load-displacement curve and stress-strain diagram. (show with diagrams).
2.	Draw a Mohr stress diagram at three distinctly different confining pressure conditions.
3.	Describe Poisson's ratio and Poisson effect.
4.	Describe the plastic behavior of rocks with a stress-strain diagram.
5.	Describe the characteristics of the mid oceanic ridges.
6.	Describe the geomagnetic reversals in the mid-oceanic ridges.
7.	Give the list of the five main principal deformation mechanisms (2 marks). Describe the process of dissolution creep. Give figures wherever required (8 marks).
67.	Names various modes or components of deformation. Describe with neat sketches rigid body and non-rigid body deformation.
68.	What are superposed folds? Explain. Describe the four conditions that give rise to the four different types of fold interference patterns.
69.	Define Force and stress. Calculate the stress condition one km underground under the hydrostatic condition in a granitic terrain.
70.	Write the stress equation and show how to construct a Mohr's circle. Construct Mohr's circle for stress on lithostatic condition. Determine the normal stress (σN) and shear stress (σs) values for a plane that makes an angle (θ) = 30° with (σN) ($\sigma 1$ = 40 MPa and $\sigma 3$ = 20 MPa).
71.	Using the stress equations calculate the magnitudes of Normal (σn) and Shear (σs) stresses on an inclined plane whose normal makes an angle $\Phi = 30^0$ with the vertical greatest principle stress axis along the clockwise direction. The given values are: $\sigma 1$ (vertical stress)= 40 MPa, $\sigma 3$ (horizontal stress) = 20 MPa. Illustrate your answer with a sketh.
72.	Define Force and Stress. Calculate the stress condition at a depth of 1500 m with vertical force of 40 MPa and horizontal stress of 20 MPA.
73.	Define stress. What are the normal and shear stress? Calculate σN and σs stress conditions on a plane inclined at an angle θ to F.
74.	What is a Mohr's circle or a Mohr's stress diagram? Describe the method of construction of a Mohr stress circle and its use.
75.	Define Young's Modulus and its relationship to stress and strain. Describe with a neat diagram the stress-strain diagram during a deformation. Also show a diagram of plastic behavior of rocks during deformation.

76.	Name the six most important factors influencing the behavior of rocks during a deformation? With a diagram explain the deformation of rocks under varying temperature conditions.
77.	Names various modes or components of deformation. Describe with neat sketches rigid body and non-rigid body deformation.
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16.	Define stress. What are the normal and shear stress? Calculate σN and σs stress conditions on a plane inclined at an angle θ to F.
17.	Draw a neat sketch showing all the internal zones of earth and their depths. Describe also how P and S seismic waves passes through the earth.
18.	Describe in brief crust, mantle, lithosphere and asthenospehre, and describe their main characteristics.
19.	With a neat figure show the major zones of earth's interior along with the depths of boundaries in km (2 marks). Discuss the nature of seismic wave velocities at the crust and upper mantle and discuss their implication on characterizing lithosphere and asthenosphere (8 marks).
20.	Describe and discuss in brief various theories proposed for the origin of the Earth's crust (4).
21.	Describe in brief the tectonic framework of Africa.
22.	Describe the East African Rift system and its origin and districtuion.
23.	Describe the cratons and mobile belts of African continent,

24.	Describe in detail the main elements of a geological map.
25.	With necessary figures, describe in brief the principles of stereographic projection. How many types of stereographic nets are available.
26.	Describe the methods of plotting a plane and a line on a stereographic projection. How do you find the intersection lineation produced by the intersection of a joint and a foliation plane?
1.	What are superposed folds? Explain. Describe the four conditions that give rise to the four different types of fold interference patterns.
2.	What is a superposed folding? With clear figures, describe the three basic types of fold interference pattern.
3.	What is a superposed folding? With neat sketches, describe type 0, type I , type 2, and type 3 superposed folding patterns.

Warning: These questions were prepared on the request of some students. These model questions may be referred by only those interested. These questions are only suggestive and the questions may or may not appear in the exam in the same format and language. Questions are not exhaustive and other questions may appear in the exam.